



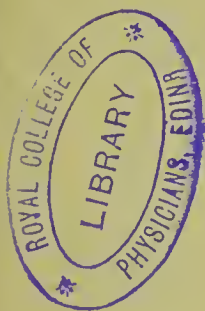


ON THE

COMMUNICABILITY OF CHOLERA

BY

HUMAN INTERCOURSE.



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*"Magna est veritas, et prevalebit."*



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IN the Eighteenth Annual Report of Dr. J. M. Cunningham the Sanitary Commissioner with the Government of India, 1881, at page 127, para. 142, occurs the following remarkable sentence:—

“The experience of fairs and other gatherings in this country has, again and again, testified to the truth of the conclusion, that cholera is not carried by persons from one locality to another, so as to cause persons not themselves exposed ‘to the necessary local influences’ to become affected by the disease. Coincidences certainly can be cited, in which the arrival of persons from a cholera-affected district has been closely followed by an outbreak of the disease; but even these coincidences are far fewer than is generally supposed.”

This sentence is again repeated in a paper read by Dr. Cunningham before the Epidemiological Society in 1883.

This is certainly a remarkable assertion coming from such an authority. Let us see how far it is borne out by the records, not only of the Sanitary Commissioner with the Government of India, but by the Sanitary Commissioners of other provinces notably those of Madras and Bombay.

The first annual report of the sanitary department is that of 1864-65 and is called "The first Annual report of the Sanitary Commission for Bengal" for in those days Aaron's rod was no bigger than those of his fellows.

"The rules laid down by the cholera Commission start with the assumption that no general measures of sanitary improvement, although these too are essentially necessary, will alone enable us to contend successfully with cholera, but that special measures are also required, based upon the belief that the cause of cholera is a specific poison, propagated according to certain special laws."

"The rules of the cholera Commission provide accordingly, for the instant removal of the troops from the place in which cholera has appeared, and for stopping all communication with the infected locality until it may safely be believed that all danger has ceased. It is assumed that cholera is communicable by human intercourse; the Commission, while it avoids the discussion of any theory, evidently leans to the belief that the disease is disseminated by the discharges from cholera patients, and many of the rules are framed to meet this presumed danger."

The second report that of 1865 contains nothing to the point in the matter under consideration.

The report for 1866 contains a short notice, p. 56, para. 69, of the cholera during the Viceroy's durbar. "The disease would appear to have been imported by the camp of the Agent of the Governor-General for Rajpootana, as it was attacked in marching through the Bhurtpur district, but it is difficult to trace its progress to any communication with the infected camp, which was as much as possible isolated."

The report for 1867, contains an elaborate, voluminous and most carefully drawn up report of the cholera epidemic which swept over Northern India in the year under review and which had its starting point at the great Hurdwar fair. The report in question comprises four sections and extends over 145 pages, it is therefore impossible to give it here *in extenso* but we extract some paras. from section IV.

“General conclusions.” The report is signed, and evidently written by J. M. Cunningham, M.D.

“Having noticed the chief points which demand attention in relation to the great Hurdwar gathering of 1867, the next point to be considered is the dispersion of the pilgrims, and the effect which they had in the dissemination of the disease. On this question the facts have been narrated with great care; every statement of any importance has been given, for the evidence has been considered not with the object of supporting any preconceived theory on the mode of propagation of the disease, but with the sole view of endeavouring to ascertain the truth. Did the pilgrims as they returned to their homes carry cholera with them, and thereby occasion the outbreak which subsequently followed in the various districts through which they traversed, or to which they themselves belonged?

“On the first part of this question there can be no difference of opinion. That cholera went with the pilgrims from Hurdwar and accompanied them to a greater or less distance in every direction from it is a fact *which admits of no dispute*. The history of their return which has been already given illustrates this point so clearly that it is not necessary to recapitulate the facts. Suffice it to say that the pilgrims bore the disease with them to a distance varying from 50 to 300 miles in almost every point of the compass.

“This fact in itself may be regarded as evidence of communicability of the disease. That the pilgrims imbibed the poison at Hurdwar in large numbers cannot be doubted, but it is not probable that the disease should remain latent so very long as to appear among some of them only when they had reached places so far distant as the Upper Provinces of the Punjab. At Goojerat, for example, the first case was a pilgrim who was attacked there on the 28th April. In Cashmere the first cases were pilgrims who were attacked in the second week of June. Judging from all that is yet known of the disease, it appears much more probable, that these and others who were seized weeks after they had left



Hurdwar were infected by pilgrims in whose company they had travelled, than that the germ of the disease had remained all that time undeveloped within their systems.

“ But the details regarding the advent of cholera-stricken pilgrims and the subsequent appearance of this disease among the general population of the districts who had previously been altogether free from it, are very much stronger. It will be necessary in this point of the enquiry to separate the facts as they have been stated from the opinions with regard to them which have been expressed by the various observers, for though the latter are very valuable, they cannot be accepted in evidence as carrying the same weight as the former. The facts have been already recited. Below Allyghur on the south, and Shajehanpore on the south-east, no connection can be traced between the return of pilgrims from Hurdwar and the subsequent appearance of cholera. The history of the occurrence of the first case in all those districts which lie to the north and north-west is shortly recapitulated in the annexed statement.

“ The facts exhibited in this statement are conveniently shown in the annexed map, in which the relative position of the different places, the main lines of communication, and the dates on which the first well authenticated cases occurred have all been entered. The results may thus be summarized. Excepting Goorgaon in which the history of the first case is doubtful, no cholera appeared in any of these fifty-one stations or districts until ample time had elapsed for the pilgrims to re-appear or for others to enter them from infected places. There was no simultaneous outbreak of the disease over a large area. But the general evidence is not merely negative, for excepting Goorgaon there was no cholera in any of the fifty-one places named, until the pilgrims actually had returned, and even in Goorgaon the epidemic prevalence of the disease dates from their return. The fact is of importance even although the outbreak of cholera took place in a few districts at so late a date as to render its having any direct connection with pilgrims very improbable.



“ But even more remarkable is the evidence that in most instances the first cases in the district were pilgrims who had been to Hurdwar. In thirty-five out of the fifty-one districts the first persons attacked were pilgrims, and after they had been seized, the disease appeared and spread among the residents. In this number is not included the case of Deyrah in which the first seizure was a traveller and probably a pilgrim, nor Meerut where the first occurring in a resident was doubtful, nor Allyghur, nor Goorgaon nor Umballa in which two persons, a pilgrim and a non-pilgrim, were seized the same day, nor Jhelum where the first person attacked was a boatman at the ferry crossed by the pilgrims, nor any other place regarding which any doubt has been expressed, and yet there remain thirty-five cases out of fifty-one in which there is the clear statement of the Medical or District officer, and sometimes of both that the pilgrims were the first victims.

“ But whatever theoretical differences of opinion may exist as to the propagation of cholera, the facts of the great epidemic of 1867, and its spread over Northern India, teach no doubtful lesson, *and it is this that human intercourse plays a very great part in the diffusion of the disease, and that returning pilgrims, in particular, are very dangerous arrivals.* How is their return to be regulated, and what measures can be adopted, as far as practical, to diminish the danger? The question is one of very great difficulty. Were sanitary considerations alone to be kept in view, it could be easily answered. In my letter to the Government of India, in the Military Department, No. 312, dated the 29th May 1867, an opinion was expressed that quarantine should be established. Regarding the matter merely in a sanitary light that opinion remains unaltered, but a careful consideration of the many important points involved leads to the conclusion that any general attempt to enforce this measure is undesirable.”

The report for 1868 briefly notes the arrival of Drs. Lewis and Cunningham “to conduct a special investigation into

the mode of origin and spread of cholera in India." Cholera was little prevalent during 1868.

In 1869 cholera was widely spread over India. The report for this year is almost as lengthy as the report for 1867, it extends over more than 75 printed pages. It is however very confusedly drawn up, and it is somewhat difficult to determine what conclusions the author has arrived at from the evidence before him. It becomes evident however he is not such a staunch believer in the spread of cholera by human intercourse. For instance cholera was very prevalent in Assam and it is recorded that Dr. White practising there is strongly of opinion that cholera is not imported into Assam by Bengal coolies although he admits he has known "one instance in which the introduction of cholera could be attributed to the influx of imported laborers from Bengal." Dr. Meredith, Protector of Laborers, is clearly of opinion it is imported and he submits the following memorandum.

"Steamer *Lahore* arrived at Dhunsiri Mookh Ghat on the 18th of February, bringing imported laborers to Assam. There was cholera on board. A number of laborers were landed for the Central Assam Tea Estate; two of them died of cholera at the Ghat the night of the day they were landed, the rest went on to Diffloo Factory. At the factory the disease appeared again among them, and nine more imported laborers died of it by the 4th of March. After this date no Bengalees died of the disease; but the disease broke out among the Assamese local laborers, three of them died at the garden, and others suffering from the disease were conveyed to their houses in the villages lying near. The malady now broke out among the villages with fearful severity, and the death-rate has been deplorably heavy. According to my informant, the cattle have suffered as badly as the people. I am unable to state the extent to which the disease has spread among the native population. I visited Diffloo Factory on the 11th of March, and felt satisfied that the epidemic then raging among the villages in

the neighbourhood was traceable to the disease prevalent on board and imported by the *Lahore*."

"In the Arrah Jail where there were 18 cases and 6 deaths from cholera we are told 'no communication took place either directly or indirectly with persons affected outside.' It appears however that 'adjoining the Jail there are several huts occupied by people who are only remarkable for their dirty habits,' and that among them cases of cholera had occurred between April and July."

In the case of the Central Prison (at Allahabad) however Dr. Richardson reports that owing to its favorable position a really efficient quarantine was kept. Cholera here also appeared in the vicinity but did not gain access within.

"Among these questions" writes Dr. Cunningham "we may first consider whether there is any evidence to show that the cholera of the past year was spread over the country by means of human intercourse. On this point many facts have been narrated in the first section, and it must be admitted that, as a whole, they are very much at variance with such an idea. From nearly every cantonment and from every regiment which was stationed in it, as well as from nearly every Jail, the statement is made with a sameness which is almost monotonous, that no communication, either direct or indirect, could be traced between the person first attacked and any previous case of the disease. The evidence is by no means perfect, nor is it of such a nature as would justify the conclusion that the cholera was not spread by human intercourse. Such as it is, however, it would favor the opinion that the disease was not disseminated by such means."

"Any evidence adverse to such an opinion must, in the main, be of a negative character. No communication could be traced, but this does not by any means prove that such had not taken place. The facilities for communication even in the case of a Jail, where quarantine measures are in force, are very great, and persons affected with cholera may easily have had indirect intercourse with a previous case, and yet

the fact may be altogether unknown. The difficulties of such an investigation are very great and it is open to many sources of error, but no pains should be spared in endeavouring to sift *all* the circumstances connected with the appearance of the first cases. On this point the great object should be to accumulate facts tested with as great care as possible."

"In a few cases the medical officers have expressed their opinions that the disease had been imported into the community under their care, but the grounds on which such an opinion is based in some instances are not given at all, at others they are stated very imperfectly, while in others again they are evidently insufficient to account for what occurred. In some instances, such as the escape of the Allahabad Central Prison, concurrent with a rigid system of quarantine, there is negative evidence to favour the idea that the disease is spread from man to man; but, taken as a whole, the facts which can be gathered from the general history of the epidemic in support of the theory of human intercourse as the means by which cholera covers the country are very few, and wanting in that precision which is so essential before they can be accepted in the way of evidence."

"It is very desirable that *all* statements bearing on this most important point should be carefully sifted on the spot without delay, and that the whole question of importation should be strictly investigated whenever any case occurs. But, in order that this investigation may be satisfactory, it must embrace several points which are apt to be lost sight of. When cholera appears to have been due to importation, it is essential that *all* the details regarding the circumstances should be most *fully stated*, the name of the person by whom it would appear to have been brought, with minute particulars regarding the place from which he has come, the history of the disease in that locality, the mode of travelling, the time occupied on the journey, and the period after its termination at which he was attacked.



Nor is it sufficient to show that an individual after coming from an affected locality was seized with the disease. It is necessary, in order to prove importation, that it should be shown first that, previous to his arrival, no case had occurred in the locality or neighbourhood to which he has come, and also, in the second place, that some connection existed between this imported case and those which subsequently occurred. These are points which are often not enquired into, and it is assumed that, because the epidemic became evident after the seizure of a person who had come from a place where the disease was prevalent, the evidence of importation is complete. If there is reason to suppose that the importation has taken place by means of merchandise or in any other indirect channel, the facts must be examined and tested in similar detail."

The year 1870 was remarkable for the limited area over which cholera spread, but within this small area the general population suffered considerably. The troops both European and Native suffered very little. In this report great prominence is given to the evidence of the non-communicability of cholera, by human intercourse. Speaking of the Hazareebagh District Jail, 39 cases were reported as having occurred between July 4th and August 8th, of which 8 only were fatal. Dr. Coates is of opinion that there was no evidence of contagion. "No Hospital attendant contracted the disease; none of those sent hourly day and night to give medicines or to bring in sick men or reports got it. Again, one of the women who passed through a prolonged state of collapse, and who was largely purged and vomitted, had a baby about six months old who was suckled, who slept in the same bed and under the same clothes, and was often rolled up in the mother's cloth with which she often used to wipe her face, and which was constantly more or less wet with cholera *emesis* and yet this baby neither got ill or even loose in the bowels."

No evidence whatever of communicability or spread by human intercourse is given in this year's report.

In 1871, cholera was as little prevalent as in 1870, either amongst the troop or the civil population. It attacked however H. M.'s 96th Regiment at Dinapore. "In regard to the cause of this outbreak, the medical officers state that they can offer no satisfactory explanation. It was ascertained beyond doubt that cholera had existed in a village in the vicinity of the Rifle Range, where the company in which the first cases occurred had been encamped within a few days of the date on which the disease appeared amongst them, but there is no evidence of any communication with infected persons."

Cholera appeared in Lucknow. "There was no evidence to show that the disease had spread by contagion. On the contrary, the fact that in only 41 instances did two cases occur in the same house, is strongly opposed to the idea that the epidemic spread to any great extent through intercourse with the sick."

In this report allusion is made to the outbreak of cholera in H. M.'s 18th Hussars at Secunderabad which will be again noticed when we pass in review the annual report of the Sanitary Commissioner with the Government of Madras. The following are the conclusions arrived at by Dr. Cunningham which we may here remark are in direct opposition to those arrived at by Surgeon-Major Cornish, Sanitary Commissioner for Madras.

"As has been already stated, the European troops in very few stations in Madras were attacked by cholera. To this remark the 18th Hussars at the large station of Secunderabad, the Military cantonment in the immediate vicinity of Hyderabad in the Deccan, is a striking exception. The particulars of this outbreak formed the subject of much careful enquiry, and I may here briefly recapitulate the facts as summarized in a letter on the subject which I addressed to the Government in October last, and in which I submitted, as requested, an opinion on the different theories which had been advanced to account for the sudden sickness.

"The disease appeared early on the morning of the 25th May and rapidly increased. The number of cases which occurred daily within Cantonments and in Camp is shown in the annexed statement.

Days of the outbreak.	Date.	Place where quartered.	No. of attacks.	No. of death.	Remarks.
1st day ...	May 25th*	Cantonment Secunderabad.	35		*And up to 4 A.M. of 26th.
2nd " ...	" 26th	In Camp at Nagaram ...	13		
3rd " ...	" 27th	Do. do. ...	15		
4th " ...	" 28th	Do. do. ...	5		
5th " ...	" 29th	Do. Chereali ...	10		
6th " ...	" 30th	Do. do. ...	4		
7th " ...	" 31st	Do. do. ...	2		
8th " ...	June 1st	Do. do. ...	...		
9th " ...	" 2nd	Do. Kusrah ...	...		
10th " ...	" 3rd	Do. do. ...	1		
Total ..			85	39	= 45.88 per cent. of cases.

"To account for this sudden and violent attack, four theories have been advanced:—1st, that the disease was imported into cantonments by native travellers, 2nd, that it was due to the pollution of the water-supply, 3rd, that it was occasioned by unhealthy influences arising from the debris of some old native houses recently knocked down which had been strewn along the roads of cantonments, 4th, that the disease was due to some atmospheric influence which found circumstances favorable to its development either in the conditions existing in that portion of the cantonment where the 18th Hussars were quartered, or in the men of the regiment whose health had, it appears, been deteriorated by several years' residence in the station. In favor of the first of these views there is little or no evidence. A few cases of cholera had certainly appeared among the native population before the Hussars were attacked, and of these cases three happened to be travellers. But there is nothing to shew that these men had brought the cholera, or that the cases which subsequently occurred were due to any communication with them. The facts of the epidemic, moreover, as it affected the Hussars, so far as they have been recorded, do not favor the idea of contagion. The disease appeared suddenly with great violence, many cases



occurring almost simultaneously in different quarters.\* There is no single fact adduced to show that it spread from man to man, or that it multiplied from first cases as so many centres of infection ; on the contrary, on the very first day the outbreak was at its height, and it declined in a very marked manner when the regiment was removed from the locality in which it first appeared. That the phenomena are to be justly ascribed to any unusual or specific pollution of the water is equally unproved. The supply was, it appears, drawn from the same source as that which had been previously used by the Hussars. The same water, moreover, was drunk by others without any ill-effects.† The suggestion that the epidemic was due to the *debris* of native houses saturated with impurities is ingenious, but such a view of the case hardly deserves serious consideration. Impurities of any kind are favorable to the production of disease but without very clear and strong evidence such a trivial cause could not be considered sufficient to produce an epidemic of cholera. The fourth view which I have mentioned appears to be more consistent with the facts than any of the others. The occurrence of a violent thunderstorm almost at the same time as the cholera disappeared, favors this conclusion. But it is not my object to urge any merely theoretical opinions. Practically the lesson taught by this epidemic is the same as that which has been taught by every other epidemic—that the cause of cholera is as yet shrouded in very impenetrable darkness, and that the best means of prevention are sanitary improvements. The lines occupied by the 18th Hussars at Secunderabad have, it appears, long had an evil reputation. The value of immediate movement from the infected locality is, I believe, shown in the experience of this epidemic. Under ordinary circumstances, the disease increases during the first three or four days and then declines. Had

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\* Which is quite compatible with spread by water contamination.

† Dr. Cunningham labors under the curious notion that every person is equally liable to choleraic contagion.

the regiment remained in their barracks, there is every reason to suppose that the 35 cases which occurred on the first day would have culminated in an outbreak much more terrible than that which actually occurred. The marked decline in the number of cases immediately attendant on going into camp is very satisfactory."

1872. During 1872 another epidemic of cholera swept over Northern and Western India, and Dr. Cunningham thus writes concerning it.

"What is the history of this epidemic? What are the facts connected with its spread, and how far do they tend to increase our knowledge? Is cholera a contagious disease? Is a specific poison multiplied in those who are attacked, which is capable of being transmitted to, and of producing like symptoms in, others; and if this be the case, is this from an infected locality which germinates and bears its deadly fruit wherever the local conditions are suited to its growth? Is human intercourse *the* great and indispensable means by which cholera is borne from its home and spread over the earth? These are weighty questions—questions which affect the well being not only of India, but of every country in the world, questions which, in these days of rapid and constantly increasing communication between the East and the West, have a significance and a practical importance very much greater even than they had before. And how are they to be answered? Not by theoretical discussions, however clever or learned, as to the nature of cholera and the mode of its diffusion, but by a patient investigation of facts—of all the facts so far as they can be ascertained. No country in the world presents such a field for the study of cholera as India, where one portion is the home of the disease, and others are subject to such severe and frequent invasions."

The following is given from page 13 to 15 in the report of the same year (1872).

"Other instances from Jubbulpore are cited in the notes, but the mere narration of the facts, as related in the notes,

is quite sufficient to show how very far short they fall of affording any proof of importation."

"In the Googranwalla district the evidence merely amounts to this, that the first known case was a traveller who was attacked on the day of his return home from an infected district, and that four other cases followed within a few days. With one exception, there is no reason to believe that any actual communication had taken place between the travellers and those who afterwards suffered. It is believed that the medium of contagion was the drinking water, but on this point I shall reserve any remarks for a subsequent paragraph, when the whole of the evidence on the water theory will be considered."

"The story of the Mahomedan priest who is said to have brought cholera into Goojrat is very open to question. He was taken ill immediately on his arrival from Lahore where cholera was prevailing, and died on the 6th August. The original account stated that 'on the 7th no less than ten persons were attacked, most of whom were friends of the deceased, and had remained present with him during his illness.' As the whole evidence hinged on whether any had been attacked who had held no communication with him, further inquiry was made at my suggestion, and it was then reported that all of them had been with him. The inquiry was made through native officials, and although they may be correct, there is reason to doubt whether the data collected after such a lapse of time can be depended on. I mention the matter, however, not in order to throw discredit on the statement, but to show the importance of investigating the facts most minutely at the time, and also how very difficult, if not impossible, it is to learn what actually occurred among the general population. It is to be noted, moreover, that the Mortuary register shows one death from cholera in the Goojrat district in May and two in July. It is quite possible that these entries are incorrect. Other instances of supposed importation and communication in the Goojrat district are cited, particulars of which are given

in the notes, but it would occupy too much space to discuss them in detail."

"As the epidemic has been attributed in more than one report to the pilgrims returning from the Hurdwar fair, it will be well to examine very shortly what are the facts bearing on this point. On reference to the notes regarding Roorkee, it will be seen that there was no outbreak of cholera at the fair. Only two cases were seen there, of which one was fatal and two occurred among the pilgrims at Seharanpore. Next come the facts which are recorded in the notes on Umballa. The first case known in this district was one of the pilgrims who was attacked at Jirgadree on the 14th April. This town contains 11,600 inhabitants, but no other death from cholera was reported in it for four months. Altogether there were only five during the year. At Belaspore, Sadhowra, and other places which are mentioned, deaths of individual pilgrims are recorded. In some, one or two of the residents died also about the same time, but no outbreak follows in any one of them, and there is no evidence that the residents attacked had had any communication with the pilgrims. At Munnee Majia and also at Roopur where the disease was more severe, there are discrepancies on material points and a want of proof to connect the outbreaks with the pilgrims.\* In the south-west portion of the district cholera appeared about the same time, although there is no suspicion of importation in this direction. In the neighbouring district of Kurrul it had appeared even earlier. But to trace this particular band of Jummū pilgrims upwards, the next place where they are heard of is Sealkote, and here they shewed no signs of the disease. On the 22nd May news reached Sealkote that cholera was severe at Jummū, but as this is not in British territory, there is no registration of deaths, and no information of any value can be obtained from the Cashmere authorities."

"Cases are frequently cited, in support of the idea that

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\* Contrast this with the account of 1867 outbreak.



cholera is spread by importation, in which persons have been attacked within a few days of their arrival from an affected locality. But this fact is no evidence that cholera is diffused by human intercourse. Persons may contract disease in one place and show the first symptoms of it in another hundreds of miles distant. The evidence to prove spread by importation must shew that other cases followed and that these cases were connected with, and due to, the imported case. And to state the facts fairly and fully all the instances must be given in which imported cases were *not* followed by any other cases, for these instances are just as important and as necessary for forming a right conclusion as those in which the importation seems to have been the cause of the outbreak."

"In dealing with travellers and especially with pilgrims, it must also be remembered that hungry, weary, very dirty and crowded together, as they so often are, they are in the very circumstances calculated to render them susceptible to cholera, if cholera be about. Fatigue, error of diet or strong emotion, as was exemplified in many cases in this epidemic, all render the person liable to attack. Considering the favorable conditions which they present for the propagation of disease, the wonder is that pilgrims do not suffer more frequently. But it would be altogether a mistake to suppose that in the Upper parts of Northern India, the Punjab, for example, cholera generally or even frequently follows in the track of pilgrims. The Hurdwar fair is sometimes spoken of as if it were a notorious fact that year by year it has formed the great centre from which the disease radiated; but, so far from this being the case, the fair at Hurdwar has been singularly exempt from cholera. In 1783, there was a severe outbreak, but this is the only mention of cholera in the early years. In 1857, the pilgrims suffered; but with this exception the disease appears to have been unknown among them from 1854 to 1866. In 1867 there was the great outbreak which has been described in the Fourth Annual Sanitary Report.

From 1867 to 1873, the annual fairs have passed without any sickness, beyond one or two isolated cases. Why the large gathering at Hurdwar, in spite of the susceptibility of its composing elements, should so frequently escape; whether it be due to the early time of year at which the fair assembles, or to the geographical position of the place, or to some other cause, it is not my purpose now to enquire. For the present it is sufficient to note the fact."

1873. The year 1873 was one of comparative immunity from cholera and the records have nothing bearing on our enquiry.

1874. "The comparative absence of cholera throughout India during 1874 is very striking." Calcutta however suffered more than any year since 1870.

1875. During 1875 on the contrary cholera prevailed over a large portion of the continent of India, from the Himalayas to Cape Comorin and the following extract shew the conclusions arrived at by the Sanitary Commissioner with the Government of India.

"The area covered by epidemic cholera in 1875 is shewn in the map which accompanies this report. In such a map all that can be attempted is to indicate in a general way the areas of prevalence and exemption. The most striking facts which it illustrates are the very large area which the epidemic covered, its prevalence over nearly the whole of Southern India, its extension in the north-west, chiefly in those portions which lie near the Himalayas, several stations on which also suffered; the escape of great part of the Central Provinces and of the Upper Punjab, the escape of the north-eastern part of Madras, and also of the south-western part, in which the neighbouring district of Bombay also shared."

"These areas of prevalence, it is to be observed, are not the areas through which the great highways of traffic lead,\* nor are the exempted tracts those which are removed from

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\* Looking at the map one would say "The areas of prevalence" are the areas through which the great highways lead.

the great lines of communication. Over great part of the country in which cholera was most severe there are no railways, and the roads are often indifferent. Through part of the Central Provinces which escaped, one of the great trunk lines of railway, on which there is much and constant traffic, runs. In the Upper Provinces the extension of the disease was not along the high road, but over an area where the means of communication are comparatively difficult and little used."

"In looking at the map or at the statistics of the districts included in the epidemic, it must not be supposed that the disease was universal, or that it affected every portion of the population. The popular impression\* with regard to cholera seems to be that when once it attacks a district, it spreads from village to village until all have more or less suffered. But this idea is altogether a mistake. In most of the districts where cholera prevailed the villages attacked were the exception, and even in those parts where it was most prevalent, and where it, beyond all question, attained the proportions of a very severe epidemic, many towns and villages escaped."

"In regard to none of the 67 communities affected with cholera is there sufficient evidence to show that the outbreak was due to importation. At Agar the only person attacked had come two days previous from Oojein, where cholera was prevailing; in other words, the causes of cholera to which he had been exposed at Oojein apparently did not produce their results until after his arrival at Agar, but there was no spread of the disease. The causes of cholera which existed at Oojein do not seem to have existed at Agar, and the seizure of the one man who was attacked to all appearance in consequence of his having been at Oojein was insufficient to produce any further case. This solitary instance, out of the total of 67, affords an illustration of how cholera may be imported and cause no outbreak. The remaining 66, on the other hand, are examples in which

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\* This is quite new.



outbreaks occurred without any proof that they were due to importation. In many of the reports as extracted in the notes, it will be seen that the disease is ascribed to importation merely because cholera was more or less prevalent in the vicinity. In the 73rd Foot at Cawnpore, for example, it is attributed to indirect communication with cholera-stricken persons by means of the native servants. In the 35th Native Infantry, at the same station, it is explained by the fact that the first man attacked had only just returned from leave. In the 1-18th Foot at Moradabad, the punka coolies are supposed to have been the medium of communication. In the Royal Artillery at Meerut, the barracks were under repair; native workmen were thus about, and, moreover, some of the hospital establishment resided in a neighbouring village where cholera prevailed. At Dharmasala, travellers from Jawalamukhi and Mundi are credited with having introduced contagion. But in none of these or in any one of the 67 bodies concerned, except Jubbulpore, to which reference will be made hereafter, is there any attempt to prove by evidence that the resident in the locality who was first attacked had suffered in consequence of communication, either direct or indirect, with some individual, whether ill of cholera or in good health, who had come from an affected locality. The prevalence of cholera in the vicinity seems not unfrequently considered sufficient proof of importation, especially where, as is generally the case, communication, in spite of any attempts to the contrary, continued to a great extent unrestrained; but however strongly an opinion founded on such grounds may be expressed, it is merely an opinion. In some instances the circumstances were adverse even to this theoretical view. In Kasauli, for example, there had been no cases of cholera among the natives before the Europeans were attacked. Although the Europeans suffered severely, the bazaar remained free of the disease throughout\*, and the only cases

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\* This does not bear out the present Army Sanitary Commission theory that dirt is the cause of cholera.—E.

among natives were a few chiefly among the servants who were most exposed in camp. So far as is known, at Ferozepore there was no cholera among the natives when the disease attacked the European troops in the cantonment; and at Meean Meer the natives did not suffer at all."

"It has been already said that Jubbulpore forms an exception to the general statement that at none of the places concerned is there any attempt to prove that cases of cholera occurring in them had been due to importation. The matter is not mentioned in the report from Jubbulpore, but it was brought to my notice by the Sanitary Commissioner for the Central Provinces, and I enquired into the circumstances during my recent tour. As may be seen in the notes, the only one of the military attacked at this station was a sepoy of a Bombay regiment who was rejoining from leave. His illness commenced in the train; he arrived at Jubbulpore on the 27th August, and next day applied for relief at the hospital of the 16th Madras Native Infantry. He was placed in a separate building and then transferred to a tent close by. A few days afterwards cholera broke out in the village of Katinga, which is about 300 yards distant, and there were in all 10 cases reported in it. This village is on the banks of a small stream which passes by the hospital, and it was supposed that the outbreak was due to the water having been polluted with the discharges of the sepoy, which the sweeper, instead of burying as he was ordered to do, may perhaps have thrown on the ground. But there is no evidence on any of the points required to substantiate the story. It is not known that the sweeper had thrown the discharges on the ground. The people do not drink from the stream, but from "Jiriahs" or wells sunk near it. The water was very foul and the whole village very dirty, but it is not probable that any impurity, even if it had found its way into the stream, could have percolated into these wells. The facts so far as they are known may be regarded as favouring the idea that the outbreak in the village was in some way due to communication, but the most important

particulars are too vague to be of much value in determining this matter."

1876. "At Murree severe outbreaks occurred among the convalescents at the depôt and among the detachments of several regiments encamped at Gharial on the Kashmir road between 3 and 4 miles from Murree."

"Cholera had been prevalent in Kashmir since the beginning of the year, and common opinion attributed the appearance of the disease in Murree to importation from Kashmir. The evidence, however, on this point is not conclusive. It appears from the report of Dr. Bellew, the Sanitary Commissioner for the Punjab, that several fatal cases of illness occurred in the Murree sanitarium in the course of May and June, which were not at the time recognised as cholera, but which Dr. Bellew, from information that he subsequently elicited, believes were cases of true cholera.\* The disease, however, did not become epidemic in the station till after the heavy rains of July had set in. The circumstances attending the outbreak are thus related by Dr. Bellew:—

'The first undoubted case of cholera in Murree occurred on the 13th July. The sufferer was a water-carrier employed since 1st April preceding at Powell's Hotel. He was a Kashmiri, and had not left the station since he took service at the hotel. He was taken ill at noon on the 13th July, and died at 1 P.M. the following day, shortly after being taken to the Charitable Dispensary. On the 15th Mr. Powell's two daughters, aged nine and ten years respectively, were seized with cholera within a few hours of each other; they both died, one the same evening, the other the following evening. On the same day, the 15th, late in the evening, a Kashmiri, in service as a "Jampani," in the compound next to Powell's Hotel, was seized with cholera; he was carried away out of the station toward his home by his comrades on the following day. On the 16th a fresh case occurred; the sufferer, also a Kashmiri, in service as a

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\* "Believes" this is a very vague statement which would be scouted by Dr. C. if offered on the other side.

“ Jampani ” with a family residing in the neighbourhood of the hotel, and in the habit of passing close by it daily. He died during the night of the 18th in the Dispensary. This man had been three months in the station, and until the last few days had worked as a cooly at odd jobs. On the 11th he went on an errand to Kohala, and returned the next day feeling unwell. He had for some days before been suffering from indigestion and pain in the belly. On the 17th, in the evening, another case of cholera occurred ; the sufferer, again a Kashmiri cooly ; he died the next day in the Dispensary. On the 18th four fresh cases occurred with two deaths, all Kashmiri coolies. On the 23rd the disease reached its climax in twenty-two seizures and six deaths ; all natives, and mostly of the cooly class.

‘ On this day also, the 23rd July, the disease appeared among the Europeans in the depôt : one woman and two children being seized, of whom one, a child aged two years, died after 4 hours’ illness in the depôt ; and six deaths, including the woman and child attacked the day before. The cases occurred in different parts of the depôt, and were not confined to any single barrack. The disease was of a most malignant type, with little vomiting and purging and general absence of cramps ; but a very rapid sinking into collapse, in which state the patients died in from 7 to 9 hours. On the two following days, the 25th and 26th, no fresh case occurred amongst the troops ; but two deaths in each day entirely took away all those previously attacked. During these two days the troops were moved into camp on Topah Hill, about 3 miles from the depôt. On the day after arrival there, three fresh seizures, with one death, occurred ; and one, two and five cases on each of the three succeeding days with three, two and two deaths on each. From the 31st July no fresh case occurred ; but two deaths on that day and one on the 1st August closed the list of casualties in this detachment. In these ten days, twenty-four seizures and twenty-two deaths occurred among the Europeans of the depôt.



‘ Amongst the civil population (European and Native) at the same time the disease prevailed with proportionate violence and frequency up to the 6th August, after which it rapidly declined and finally ceased on the 18th August. The total numbers attacked were 9 Europeans, of whom 7 died; and 190 natives, of whom 111 died.

‘ In connection with the first cases at Powell’s Hotel, it was ascertained that two officers returned from Kashmir, arrived at the hotel on the 3rd July, and left it for Rawal Pindi on the 6th July. Their two Hindustani servants, both Musalmans, had been detained at the Kohala quarantine camp; but on release arrived at the hotel with their master’s luggage, carried by coolies supplied from the Murree side, on the 13th July. According to instructions, they left some of the luggage with Mr. Powell, and, after a few hours’ rest, proceeded down the hill. The luggage was stored in a room adjoining that in which the two children died, and with that of other visitors was passed by the inmates of the house repeatedly in their passage to and fro. At the same time that the two officers from Kashmir arrived at the hotel, another officer with three or four servants arrived from Jhelum, stayed the night and went on to the Gullies next day.

‘ Both Kashmir and Jhelum were at this time affected by cholera.’

\* \* \* “ The force that formed Major Sandeman’s escort to Quetta through the Bolan Pass, and which marched from Jacobabad in the beginning of April, suffered severely from cholera when crossing the Outchi desert, and on enquiry it was found that the disease had been prevalent among the population for sometime previously. The report on this outbreak, by Surgeon C. W. MacRury, in medical charge of the troops, will be given further on. It was probably by this route that cholera reached Kandahar, where it broke out with great severity in July. The epidemic of 1876 in the Bombay Presidency fell with great severity on the Southern Mahratta districts, but over the

rest of the province the prevalence was light compared with the previous year."

"The appearance of cholera in the Sumbalpur district in February coincided with the return of pilgrims from Pooree, and the first known sufferer was a pilgrim. From this time the epidemic spread in the district, reaching its maximum of prevalence in June: its prevalence was chiefly confined to the part of the districts south and west of the Mahanadi, the sudder town, which is situated on the eastern bank, not being reached till July. The epidemic spread southward into the Borasambar state in April, and in June and July it became prevalent in the states of Sohnpur, Patna and Kalahundi, which lie to the south of the Sumbulpur district. Bustar, further to the south, did not suffer, and there is no evidence that the tributary states that lie between Sumbulpur and the maritime districts of Orissa were involved in the epidemic. Spreading westward, the epidemic occasioned some mortality in the states of Phulghar and Saranghur in March, and in the latter end of this month an outbreak occurred in a village of the Raipur district; the epidemic subsequently spread in this direction to two or three other villages to the west of the Upper Mahanadi, but it attained to no great degree of prevalence."

"The outbreak of cholera in the town of Mandla in March was also attributed to importation by pilgrims returning from Pooree. The epidemic did not become very prevalent or continue long in the town, but it spread to several villages in the immediate neighbourhood of Mandla and these neighbouring villages apparently became a centre whence the disease was carried to one village in the Jubbulpore district, to another in the Balaghat district, and to one in the Seoni district, the last forming a centre whence the epidemic spread over a considerable portion of the district: it did not, however, at any time, attain to any great degree of prevalence in either Seoni or Mandla."

"At the time of the outbreak of cholera in Betul, the hill people were migrating in considerable numbers into the

valley of the Nerbudda to assist in the wheat harvest that was then commencing, and they appear to have carried cholera with them, for the first outbreak of cholera in the valley occurred in a party of Gonds employed in the harvest near the town of Hoshangabad. Spreading westward from this point, the epidemic reached the district of Nimar in July, and eastward up the Nerbudda valley the district of Narsinghpur was reached in the middle of May, Jubbulpore in the beginning of July, and here this epidemic met the offshoot of the epidemic which had spread southward from Benares and the eastern districts of the North-western Provinces. Crossing the Nerbudda by Hoshangabad and ascending the Vindhya Range, the epidemic of the Nerbudda valley reached Bhopal in the beginning of May, and thence passed on to Saugor, which was reached by the end of the month, thence in the latter end of June and beginning of July it spread into the Damoh district. This district is bordered by the states of Rewah and Punnah, into which cholera had by this time spread from the eastern districts of the North-western provinces."

\* \* \* "The limitation of the prevalence of the cholera to certain months of the year is perhaps more distinctly defined in the Central Provinces than in any other part of India. In epidemic seasons it appears in February or March, and spreads through the hot and dry months of April, May and June. In some districts it reaches its maximum of prevalence in June before the rains set in, but more commonly the greatest mortality occurs while the heavy rains of July and August are falling; when they have fallen, the epidemic declines and it ceases with the cessation of the rains in September. In 1876, however, this normal course of events was altered in a remarkable manner in respect of the decline of the epidemic over a considerable portion of the province. In the last week of October the number of deaths from cholera returned from the whole province amounted to only 32, but in that week nearly 200,000 people assembled at the fair annually held at



Ramtek, in the Nagpore district, and cholera broke out in this fair on the 31st October. The people then dispersed to their homes, and the statistics of the month of November exhibit a remarkable and abnormal rise in the cholera mortality of those districts which had contributed to the assemblage. The influence of season in controlling the spread of cholera is, however rendered evident by the temporary nature of this abnormal epidemic accession. In December it again subsided, and in the last week of the year only 35 deaths were reported from the whole province. Full details of this outbreak of cholera at the Ramtek fair, and of the manner in which the populations of the surrounding districts were affected by it, will be found in the special report on the cholera epidemic of 1875-76 in the Central Provinces."

\* \* \* "With regard to this appearance of cholera in Kashmir, the Sanitary Commissioner for the Punjab quotes as follows from the report of Major Henderson, C.S.I., on special duty in Kashmir:—"

'There is a general impression that cholera was brought from Jammu, where a large number of Kashmiri citizens and people of the frontier districts of the Maharajah's territories were congregated on the occasion of the visit of His Royal Highness the Prince of Wales.'

1877. "The areas of prevalence and exemption bear no relation to the high roads or railways. The tract of country along which the East India Railway passes from Allahabad to Delhi and from Allahabad to Jubbulpore, was specially free, and appears uncolored on the map as part of the exempted area. From Jubbulpore onward the country traversed by the Great Indian Peninsular Railway for a long distance towards Bombay was also exempted. The eastern districts of the North-western Provinces and Ondh, which suffered most, have many of them no railways and no great highways. This subject has received abundant illustration since the statistics of cholera in this country were first collected, and always to the same effect; but the great

fact cannot be too prominently stated, that *cholera in India in these days of railways and steam-boats travels no quicker\* than it did when there were no railways and no steam-boats, and hardly any roads.*”

“Regarding the occurrence of cholera among the troops and prisoners in Madras and Bombay no reports have been received. Those that concern Bengal fortunately deal with a year in which both classes escaped in a remarkable manner. In none of them is there evidence to prove that the outbreak was due to importation.† In the report for 1875, this term was explained to mean ‘that the resident in the locality who was first attacked had suffered in consequence of communication, either direct or indirect, with some individual, whether ill of cholera or in good health, who had come from an affected locality.’ Several instances have been adduced from Oudh in support of “importation” and as proof that cholera was propagated by pilgrims from the Ajoodhya fair, but they either support the opinion that the spread of the disease was not due to this cause, or they are too inexact to be of value.‡ The Annual fair, it may be mentioned, was stopped on account of the prevalence of cholera, but the place is at all times more or less frequented. The evidence is of this kind—on the 1st and 2nd March two persons returning from Ajoodhya were admitted into the Bulrampur hospital at Lucknow suffering from cholera; no mention is made of any other cases following them. On the 4th March a sepoy was admitted into the hospital at Lucknow with cholera. He had been at Ajoodhya on the 25th February; no other case is mentioned as following his. These and several other cases of the same kind are cited as evidence of importation, but they are really evidence against it in the sense in which the term is usually employed, and

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\* *Vide* Report of Sanitary Commissioner for Madras for 1881, where it is distinctly shewn cholera was spread quickly by returning pilgrims along the route of railway.

† It is endemic in Bengal and needs no importation !

‡ It becomes I think evident now that evidence on one side is good, on the other side of no value.

has been above defined. No one doubts that a person going, say, from Lucknow to Ajoodhya or any other place where cholera causes were at work, might be affected by them, and show signs of the disease on his return to Lucknow, just as he might catch cold or eat indigestible food at Ajoodhya, and suffer from the effects, it may be some days afterwards, at Lucknow. But the point to be determined is—was cholera in the place in which the person was ill spread from him to others? In many of the cases cited there is no attempt to prove that it was so. In a few others, of which the following may be taken as an example, such a connection is claimed, ‘a woman was taken ill last night (8th March) in Nawabgunge; she had not been away from home, but her husband had returned from Ajoodhya six days before her attack.’ But in considering this and similar statements, and endeavouring to assign to them a true value, the general history of the disease must be borne in mind. In the district of Barabunki or Nawabgunge, during 1877, 527 deaths from cholera were reported, but they were spread over 43 villages, a distribution which does not accord with the idea that its spread was due to contact with those affected.”

“According to a prevailing theory, a single case of cholera introduced into a community may communicate the disease to the neighbours or to those who may have ordinary everyday communication with the house or person of the sick man, and may thus form a centre of contagion from which an epidemic may arise destructive to thousands. This is the theory. The fact is, that during 1876 and 1877, in this presidency, 422 cases of cholera were treated in 101 hospitals, 1301 attendants came into immediate, and many of them into almost constant, contact with them for days, and yet out of these 1301 persons only 18 suffered from any symptoms of cholera. In 85 out of the 101 hospitals concerned none of them suffered at all. The only attacks which can in any way be connected with 1301 cases of cholera are 18; 16 of cholera and 2 of severe diarrhœa.”

“Moreover, in none of the 18 instances in which attendants suffered is there evidence to show that the attack was even probably due to contact with the sick. The whole evidence as given in the medical officer’s reports is extracted in Appendix D. The details necessary for forming an opinion on the point, it will be seen, are generally wanting, but in several of the cases, from an examination of dates and other circumstances, there is good reason to conclude that the attack was in no way due to attendance, at Banda for example, the only three cases in the 20th Madras Native Infantry occurred in the same hut, and the second was attacked within 5 hours of the first. The mere fact that an attendant is attacked is no evidence that he was attacked because he was an attendant. In some reports the two are conjoined in the relation of cause and effect, just as if there could be no question on the subject, as if the fact of being in attendance on a cholera patient ought actually to protect a person from the influences producing the disease in others, and virtually confer on him immunity from attack. This fallacy was pointed out in the Annual Report for 1872, but it is still very frequently repeated.”

“In order to prove that cases of cholera among attendants are due to contagion, it must be shown that the attendants suffered in larger proportion than others. In limited outbreaks the materials may not suffice for any general conclusions, but the facts should be carefully recorded, so that they may be of use when collected as a whole. In the case of any attendant attacked it should be stated how long he has been in attendance; the nature of the attendance; the date of attack; how far this date corresponded with the time when the outbreak was at its height, for this is an important point in the evidence, as tending to show whether the disease should be attributed to causes general to the community, or particular to the individual; how far the results ascribed to attendance may be due to locality, and how far the attendants, as regards locality, movements, &c.,



were treated differently from others.\* The period of supposed incubation is important. It will be observed that in one of the instances it was believed to have been 94 hours, and in another 21 days."

\* \* \* "Quarantine, isolation, and disinfection have utterly failed to prevent or arrest outbreaks among European troops in cantonments, even when carried out under the most careful superintendence. \* \* \*

Practically, then, State legislation in this matter is limited to urging on sanitary improvements apart from all theories. It may be argued that the stoppage of pilgrimages has proved beneficial, and that this can be explained only on the theory of contagion. But no such explanation is needed. The stoppage of pilgrimages in time of cholera means the stoppage of filth at fairs, of overcrowding, of fatigue, exposure and privation, all most insanitary conditions."

1878. "Solitary attacks occurring both among troops and prisoners are frequently ascribed to the individuals having recently passed through or stayed in some place where cholera existed at the time, but the question remains to be solved whether their attack were due to the influences of the locality, or to their having come in contact with persons suffering from cholera. All experience supports the former of these views, and there is certainly, in all these reports for 1878, no proof that an individual coming from an affected locality, or from recent contact with a cholera case, has formed the centre from which an outbreak has originated. Many of the Medical officers discard such a conclusion as inconsistent with the facts; others who hold to the opinion admit that they cannot adduce satisfactory evidence in its support. The Medical officer of the 73rd Regiment at Lucknow attributes the few cases which occurred in the regiment early in October to the arrival on the 1st October of four men of the 25th Regiment at Fyzabad. The severe out-

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\* Considering the amount of scriptory work regimental doctors are already obliged to perform, it is needless to say they would sooner let the attendant die quietly and say no more about him than answer all these questions.

break in the 25th had terminated only 12 days previous. These four visitors were apparently in good health and were not themselves attacked. The possible importation of cholera from a locality is, however, a totally distinct question from its being spread by the sick."

"As has been already mentioned, one of the three places in which the native troops suffered with severity was Deoli. Here including followers 133 cases were treated. The evidence of the Surgeon as regards attendants and other important matters is remarkable. Surgeon Gunn writes:—"

'There was no evidence whatever—and I enquired minutely into all the circumstances of the first seizures—that the disease was introduced into Deoli by human agency.'

1879. The year 1879 presented the highest mortality from cholera amongst the British troops, of the nine years for which statistics of European troops in the three Presidencies have been compiled. The subject cholera is treated in an Appendix in this report occupying some twenty pages with several Appendices. Much stress is again laid on the so-called proofs of the non-communicability of cholera by human intercourse, by instancing (a) the small proportion of villages attacked even within the epidemic area, (b) the want of evidence of importation when cholera made its appearance. "In many places the Medical officers have stated that the first cases could not be traced to importation, and that there was no reason to suspect that they had been due to this cause. In others, while expressing a decided opinion that they were due to importation either no evidence is adduced or it is altogether insufficient" (c) the few cases of attendants on the sick contracting the disease. "For example in L-5th R. A. at Meean Meer, 23 attendants nursed 14 cases, and none suffered; and in 1-17th Regiment at Peshawar there were 33 attendants on 24 cases: all escaped." But "in the report of the outbreak in the Alipur Jail it is stated that of 16 attendants 4 had been attacked," this statement meets with grave displeasure for we are immediately told "But the record is altogether fallacious,

and represents a proneness on the parts of the attendants to be attacked which is unwarranted by the actual facts." The evidence of non-communicability is the only evidence which can now be tolerated.

"But the interest of the cholera history of the year centres in the Hurdwar fair, and the vast influence which it is supposed to have had in distributing the disease. The fair was one of the large fairs which is held every 12 years,—a *Kumbh Mela*, as it is called—when the blessings to be derived from bathing in the Ganges are proclaimed to be unusually great, and Hindoos flock to Hurdwar in vast numbers from all parts of India. In 1867, when the last *Kumbh Mela* had been held, cholera appeared, and was believed to have been spread by the returning pilgrims all over the country. In 1879, unfortunately, cholera again appeared at the fair. The returning pilgrims suffered much, and, according to the popular belief, they were the means of affecting the people of the districts through which they passed, or to which they returned to reside. It is the opinion of many that the Hurdwar fair was the cause of the epidemic, and that under such circumstances it is the duty of the Government to repress such fairs. In order to collect data sufficient for forming sound conclusions on this question, a circular letter was addressed by the Home Department, forwarding a memorandum from this office, and clearly specifying the particular points on which information was desired. These papers are reprinted as Appendix C. of this section. It is desirable that they should be placed on permanent record, both because they show the means taken to collect evidence, and also because they may be useful on some future occasion."

"The information contained in the replies to the above circular orders is by no means so definite or exact as was desired. This is much to be regretted, as full details regarding the pilgrims would have been of special value. Had measures been taken to collect such details in each province as soon as cholera was known to be at the fair,



still more so if they had been taken before the fair commenced in anticipation of events, which, though not foreseen, were still dreaded, the difficulties of obtaining information would, no doubt, have been far less than they were three months afterwards. Still, imperfect as the data are, they contain very valuable evidence. A summary of it will be found in the statements which form Appendix D. In this all the replies which have been received are included. In some there is little that seems to bear on the points at issue, but it is desirable to withhold none of the facts, although they may appear at present to have no importance,

“ Before examining the evidence which these replies as a whole furnish, it is to be noted that the opinions of the reporters are, with few exceptions, strongly in favour of the idea that the pilgrims were the cause of the epidemic. It was a matter of common observation that no cholera had attracted attention until the pilgrims arrived; that in many instances the first person attacked was a pilgrim; that subsequently some of the residents who had not been to the fair suffered; and that then the disease became more or less general through the district. It was known that a similar history had been recorded of the last great fair twelve years before, and there was still a vivid remembrance of the calamity which had then taken place. A history of this kind could not fail to make a strong impression\* on the local observers. Moreover, they had but little means of correcting such impression by a knowledge of what was going on elsewhere, and hence it is only what was to be expected, that the civil officers and the medical officers in different districts should in most cases have formed a very decided opinion† that the cholera was spread by the pilgrims from the great fair, and that if the great fair had been stopped, the epidemic might have been prevented. The very simplicity of the doctrine and belief in the easy means

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\* Especially as it was so clearly and ably written.

† Dr. Cunningham wrote at the time. “ That the cholera went with the pilgrims in every direction is a fact which admits of no dispute.”

by which so great a calamity might, according to their view, be averted, carry with them a certain fascination which cannot fail to exercise an influence over men's minds."

"But the problem to be solved is by no means so simple as the acceptance of the pilgrim doctrine would imply. On the contrary, it is very complex, *and it may be said at the outset that, in the present state of our knowledge, it cannot be solved.\** Still it is all the more necessary on that account to examine the facts carefully, to set aside error, and to prepare the way for more accurate knowledge. But to do this with any degree of success is a very difficult matter. It requires patient investigation and a calm judgment, which shall not be swayed by any preconceived ideas, or deterred by the fear of any adverse criticism. The cholera controversy has unfortunately excited much animosity and bitterness between those who differ in opinion.† The doctrine of human intercourse is for the time the popular doctrine, both with the medical profession and with the public, and neither facts nor arguments which are at variance with this view find much favour. All this is deeply to be regretted. If any doctrine is true, it can afford to stand the fullest criticism and the most thorough investigation, and before any practical measures are based upon theories, it is essential that these theories should be substantiated beyond all cavil.

"The reasons for doubting the pilgrim doctrine are so many and so strong that they at least deserve careful consideration. In the first place, the evidence on which it is based seems altogether insufficient. It is insufficient because it is often so inexact.‡ For example, the history of the Lahore outbreak is thus told in the Punjab Report:—

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\* Hence the inutility of sending out a German Cholera Commission.—B. K. H.

† Which has unfortunately been much increased by Dr. Cunningham's proceedings, in moving the Government of India to suppress all expression of opinion from other Sanitary Commissioners and Medical Officers who differ with him.

‡ If one case was proved beyond doubt what would it matter if 20 other cases were inexact; would Dr. Cunningham acquit a man against whom murder had been clearly proved, because in 20 other cases the evidence was "inexact."

‘In Lahore two return pilgrims were attacked on the 15th April, and in the two days following 16 cases occurred, of which 12 were Hurdwari’s and 4 residents of Lahore, including a woman of European extraction taken ill in a public hack carriage. On the 23rd April the disease became more generally diffused in the city, and on the 29th in the district.’

“There is nothing to show how long the pilgrims had been at Lahore before they were attacked, nor what connection, if any, the residents who had not been to the fair had with the pilgrims. Were they attendants on them when sick? Had this been the case, the fact would most probably have been mentioned. Many persons must have come in contact with the 14 sick pilgrims. Were any of them attacked? In the absence of any statement to the contrary, it can only be assumed that none of them were attacked, and that the cases of cholera among residents occurred in people who, so far as was known, had had no connection with the pilgrims. Under these circumstances it seems much more consistent with the facts to conclude that the pilgrims suffered from cholera because the causes producing cholera were present at Lahore, than that the residents of Lahore contracted the disease from the pilgrims. This is all the more probable, inasmuch as newcomers, and especially those who have been recently fatigued, are known to be more than ordinarily prone to attacks.”

“It is frequently asserted that cholera never travels faster than man, and that therefore man must be the carrier of cholera. On this argument much of the doctrine of the spread of the disease by human intercourse, and especially by pilgrims, is based. But the argument is altogether fallacious. Even if it were proved that the cause of cholera is carried, and that it is never distributed faster than man can travel, it does not follow that it must be carried by man. Precisely the same argument might be applied to the monsoon. The monsoon generally takes many days to travel across India; it takes much longer than a man can now



accomplish the same distance with ease; but no one argues that because the monsoon never travels faster than man, therefore man must be the carrier of the monsoon, or of the marked changes in the atmospheric conditions which the monsoon brings with it.\* The illustration is selected with no view to claim connection between cholera and the monsoon, but only to show that the mere facts that cholera never travels faster than man, even if this were established, does not prove that cholera must be carried by man, for other great phenomena, on which it is self-evident that human agency can have no influence whatever, are often distributed no faster than man can travel."

\* \* \* "Many of the deaths registered during the 3rd and 4th weeks of April were doubtless among returning pilgrims who had been subjected not only to the cholera influences existing at Hurdwar, but also to the many privations and insanitary conditions inseparable from pilgrimage, and suffered afterwards in consequence. Even with these disturbing elements, however, the general distribution of the epidemic remains distinctly marked, and this of itself is evidence that it was the direction in which the pilgrims went which, in great measure, governed the attacks even among them. It was not the pilgrims who directed the epidemic. This "great fact" as regards the direction of cholera epidemics is one of much importance in the history of the disease, but it is one which is not so prominently borne in mind as it ought to be. The Civil Surgeon of Lahore remarks:—

'The experience of many epidemics has satisfied me that cholera never arises spontaneously in Lahore. In all the epidemics that I have known, it has travelled up-country, and has been regularly traced along the Grand Trunk Road or railway. Hence in the present day when cholera is heard of at Umballa or Phillour, we know pretty cer-

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\* This twaddle is printed and gravely circulated by authority of the Government of India who "deprecate discussion," by Sanitary Commissioners and Medical officers.

tainly that sooner or later during the same season it will reach Lahore. In former days it was often some weeks in travelling from Umballa to this place, but now that the railway is open it comes within a few days.\*

“In support of the above arguments, it might be shown that the pilgrim theory is in direct opposition to the exact knowledge of the disease which has been gained from the experience of troops and prisoners, and which clearly proves that cholera is not contagious and that it is not spread by contagion ; that isolation and disinfection of cholera cases, no matter how carefully carried out, will not arrest an outbreak, and that the only means for obtaining this result, on which the smallest reliance can be placed, is early removal from the locality in which the disease has shewn itself. It might be shewn that if casual contact† with a case of cholera is enough to spread the disease, then the close attendance of 5,000 persons on 3,000 cholera patients, which has been placed on record during the last three years, ought to have caused a very terrible epidemic, instead of having only produced about 100 cases which can, in the smallest degree, be connected with them, and in most of which the only connection is this—that the sick and their attendants were exposed to the same influences, in the same place, and at the same time. It might be pointed out that if the spread of cholera from place to place is dependent on human intercourse, then human intercourse ought to exercise a very decided influence on its distribution within the limits of the place where it appears. But there is no such evidence. In Simla, for example, in 1875, and again in 1879, there was no fact more clearly observable than that, although the history of the outbreak was carefully watched by many medical officers, of whom

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\* In report of 1877 we are told by Dr. Cunningham “but the great fact cannot be too prominently stated that cholera in India in these days of railways travels no quicker than it did when there were no railways.” *Vide* page 83.

† I do not know any one has ever made such a statement. I certainly have never come across such a statement.



not a few were firm believers in the doctrine of human intercourse, no incident could be adduced in support of it. It might be shown, moreover, that great epidemics, quite as great as those of 1867 and 1879, have occurred in years when there was no outbreak at any fair or other centre to which they could possibly be attributed; but enough has been said to prove that the pilgrim doctrine is by no means so simple, or so likely to be attended with practical benefit, as its supporters believe."

"It is commonly imagined that those who disbelieve in the contagion theory of epidemics are interfering with sanitary progress, but there could be no greater mistake. Theories of contagion may be acted on by private individuals if they like, but they cannot be made the basis of any action on the part of the State.\* Carried to their legitimate conclusion, they involve an interference with personal liberty and domestic happiness which would be intolerable, and would indeed be worse than the diseases they are intended to prevent. In this country more especially, any such interference is on all grounds to be avoided. All that the State can do is to teach the people the advantages to be derived from sanitary improvements, and to aid them in every way to carry out such improvements. If the supposed communication of cholera is so obscure that it cannot be traced, it is quite clear that it cannot be prevented. If the supposed cholera germ is so minute that it escapes the highest magnifying power† of the best microscopes, it is equally clear that it cannot be dealt with practically in every-day life. Nor is this view inconsistent with the importance of sanitary improvements. If cholera be due to a force or condition, and not to an entity, it is none the less necessary to guard against the evil effects which this force or condition may cause, by attending to everything which can promote health."

The year 1880 was a singularly favourable year in the

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\* But they are by England, France, Italy, Germany and other ignorant nations.

† Written before Dr. Koch visited India.

absence of cholera both amongst the troops and civil population. As regards evidence of importation the following is given. "The only instance in which the disease appears to be seriously attributed to importation is that adduced by the Medical officer in charge of H-6th Brigade R. A. at Lucknow :—' Towards the end of April a native servant returned to the station from Banda where at that time cholera extensively prevailed. The day after his return he was attacked with cholera and I directed him to be carried to the Staff hospital for treatment. The people who carried him failed to find the Staff hospital and brought him to the hospital compound of the R. A. division and put him down close to the Surgery where I found him when I came to pay the evening visit. I had him at once removed from the compound and carbolic acid thrown on the ground where he had vomited. It was in the ward a few feet off after a slight fall of rain that on July 4th (after an interval of more than two months) cholera appeared for the first time amongst the men of the R. A.' "

Dr. Cunningham remarks on this :—"The mere coincidence that a patient in hospital who lay not far from the spot where the evacuations of the servant had fallen on the ground was attacked with cholera two months afterwards *is of no value*, and can be accepted only as a coincidence to which no importance can be attached."

One is at a loss to know why evidence of this description is characterised as of "*no value*" it may not be very important, but to characterise it as of no value especially when we are so frequently told that "every circumstance" is to be noted is to betray a disinclination to admit evidence which runs contrary to the theories of the writer.

In 1881 not only was the distribution of cholera more general but its incidence in nearly all the provinces was more severe. The report for this year (1881) curiously enough is largely taken up with describing occurrences which took place in 1882. Thus we find.

"In the earlier part of the current year (1882) a striking

illustration of the general correctness of this view was furnished by the experience of four steamers during their passage with coolies up the Brahmaputra, where 62 deaths from cholera were reported out of a total of 1791 emigrants: one of the steamers the *Nepal*, with 484 coolies, lost 40 emigrants from this cause during the month of March. The accommodation on board and all the arrangements were pronounced to be good, and the only explanation offered as to the probable cause of the outbreak was that the disease may have been imported at one of the embarking stations. It does not seem to have occurred to those who gave an opinion on the matter that some light might be thrown on it by ascertaining whether it had or had not prevailed at the same time in the districts through which the emigrants had passed.\* As a fact, the general population were at that time suffering much more than they had done for years. The statement in the margin gives the cholera deaths in all the

Districts.	February.			March.		
	1880.	1881.	1882.	1880.	1881.	1882.
	1880.	1881.	1882.	1880.	1881.	1882.
Lakhimpur....	1	0	5	0	0	1
Sibsagar ...	1	4	1	2	0	0
Nowgong ...	57	6	9	25	5	87
Darrang ...	1	0	23	2	0	37
Goalpara ...	7	0	39	7	0	5
Kamrup ...	40	10	210	46	5	734
Total...	107	20	287	82	10	864

districts of the Assam Valley in February and March of the last three years, from which it is evident that in both these months of 1882 cholera was much more prevalent than it had been in either 1881 or 1880; and, what is of still more importance, that in Kamrup—the

district through which the vessels were passing when the outbreak chiefly occurred—the number of deaths from cholera, which in February 1880 had been 40 and in 1881 only 10, rose in 1882 to 210. For March the figures are 46 for 1880, 5 for 1881, and 734 for 1882. It requires but very little reflection to see that the cause from which the coolies suffered, whatever it may have been, must have been widespread, and that any explanation of the outbreak which

\* It could not very well have been imported unless it was prevailing in the district through which the vessel passed.

applies to the coolies only and leaves the people generally out of account could but have proved futile. Of the importance of providing a pure water-supply there can be no two opinions, and, as was remarked in last year's report, it is to be hoped that the results of future years may shew that the reforms introduced on board the Assam steamers have aided in reducing the mortality among the emigrants; but in such obscure and difficult questions as those which relate to cholera, hasty conclusions which deal with only one set of facts and exclude all others can only lead to error."

"The practical lesson which the experience of these three years amongst cooly emigrants of the Assam Valley inculcates is a very important one, though it is but one more added to the number of lessons so frequently taught in connection with the management of troops and pilgrims. If men, and especially men wearied by travel,\* under-fed or improperly fed, pass through a place in which cholera prevails, they are very liable to be attacked, and that in a larger proportion than the ordinary residents. When bodies of men have to pass through cholera affected localities, they should do so rapidly—any attempt at quarantining† them in such territory would be cruel, and would be analogous to detaining persons in a malarious swamp, lest they should disseminate the fever they had contracted in it in another part of the country."

It is in this year's report occurs the sentence given at the commencement of this paper "The experience of fairs and other gatherings in this country has again and again testified to the truth of the conclusion that cholera is not carried by persons from one locality to another, so as to cause persons not themselves exposed to the necessary local influences to become affected by the disease."

It will I think be admitted by any candid person who

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\* Is there any evidence to show that coolies on board a steamer are wearied, under-fed, or improperly fed? They are certainly not fatigued and are generally well fed.

† Is there any evidence of these men on board a steamer having been quarantined?



may have perused the foregoing pages that the facts they narrate will scarcely warrant the assertion so boldly made by Surgeon-General Cunningham.

1882. During this year there was a remarkable abeyance of cholera amongst the European troops. On the other hand the civil population suffered very severely although the area over which cholera spread was not so extensive as it often has been in former years. In Bengal the deaths reached the enormous figure of 182,352 a larger number than in any year since 1876.

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## MADRAS.

THE records of the Madras Sanitary Commission commence for the year 1864: that year and 1865 contain nothing bearing on the subject of investigation: in the report for 1866 we find amongst other remarks the following:—

“ This Commission have no hesitation in recording their belief that cholera is propagated from one place to another by human intercourse; and that its course on the map can be traced along the high roads from one station to another. Innumerable instances demonstrating this fact may be given as occurring in this Presidency.”

“ The introduction of cholera from the camp of Her Majesty’s 74th Highlanders quartered near the race course at Guindy is clearly shewn in the following extract from the Mortuary Report of Madras for 1864.”

‘ It seems that a hospital cooly of Her Majesty’s 74th Highlanders (that corps having at the time cholera cases in camp) was in the habit of coming home of nights to his hut in New Town. A servant of the Quartermaster Serjeant of 2nd Regiment N. I. lived in the same hut or house with this cooly, and therefore the chain of communication between the cholera camp and the house in New Town, where the first case occurred, may be regarded as complete. A child of the Quartermaster Serjeant was taken ill on the night of the 27th, another on the 28th, and both died. On the latter date the wife and child of the Serjeant-Major of the regiment, living close by, were attacked and died, and from this time the other cases followed in rapid succession. It seems that the servant boy had come to the Quartermaster Serjeant’s house late at night on the 27th, and that almost immediately after the first child that was attacked, began to sicken.’

‘Curiously enough another instance of the communicable nature of the cholera poison was afforded during the prevalence of the disease in the camp of Her Majesty’s 74th Highlanders. It is full of warning and instruction. The particulars are extracted from the stational report of the Zillah Surgeon of Chingleput.

‘Cholera first made its appearance on the 24th February 1864. Two bandymen belonging to this place, who were engaged in transporting tents of the 74th Highlanders from Guindy to Palaveram, when the regiment shifted its quarters in consequence of the outbreak of cholera, in their ignorance appropriated to their own use the *straw spread in the tents* of the cholera patients.

‘No sooner had they deposited their loads and turned homewards, than they were seized by the disease, and both fell victims to it the day after their arrival here. The disease now spread, and several cases were reported to have occurred in the town.’

“Outbreaks of this disease occur with almost unerring regularity in certain towns, which are resorted to annually, at certain seasons for celebrating Native festivals, and also at shrines such as Mahadao near Nagpore and Juggernath near Cuttack, where pilgrims collect by thousands from distant parts of the country. The entire absence of all conservancy arrangements amongst a large concourse of people, whose constitutions are generally depressed by fatigue and want of proper nourishment, speedily leads to a virulent outbreak; and as these vast masses immediately disperse, they carry the seeds of death with them along every route they travel, and their course may be traced by the dead and dying they leave behind them in their flight. These assemblages may be pointed to, with almost prophetic truth, as likely to form nurseries in which this disease will be hatched and propagated in every direction, so long as present customs continue.”

“As already stated in paragraph 6, the Commission believe that one of the great sources of cholera in this Presi-

dency is the vast assemblages of native devotees, which yearly take place at the various shrines of large towns, to celebrate festivals connected with their religious creed, and they consider that to check the evil and to extirpate one great source at its origin can only be attained by enforcing by Legislative enactment, the strictest and most practical conservancy arrangements possible at these yearly gatherings."

1867. During 1867 Madras enjoyed a remarkable immunity from cholera, and the same may be said of 1868.

In 1869 Southern India suffered from a severe visitation which forms the subject of a special report by Surgeon W. R. Cornish, the then Sanitary Commissioner.

*Vide* page 2 of the cholera report in Southern India for the year 1869.

"But although the Madras Presidency had suffered but little from cholera in 1868, the same immunity had not been enjoyed by the Central Provinces and Hyderabad. Along the northern and north-western parts of Hyderabad and Berar, cholera prevailed severely throughout the months of July, August, September and October, but it did not get so far south as Secunderabad and Hyderabad until November 1868."

"Up to the 13th November 1868 no case of cholera had been reported nearer to Secunderabad, than Mominabad, Ganga Khair, Hingolee, and the Woon taluk, localities all from 160 to 200 miles distant. But in the latter locality it was known to be prevailing late in the month of October. The absence of any systematic registration or report of deaths in the Hyderabad territories, renders this part of the inquiry less satisfactory than could be desired.

"On the 13th November an annual religious festival was going on at Bolarum, one of the stations of the Hyderabad contingent, and only two miles north of the new barracks at Trimulgherry. The temple is situated about  $1\frac{1}{2}$  mile to the south of Bolarum village, but adjoins the Military cantonment. Deputy Inspector-General Balfour had visited



the locality on the 27th October and found it quite clean. The festival was attended by some thousands of persons. It lasted for four days, and the visitors though chiefly from Secunderabad and Hyderabad, came many of them from long distances.

“The first day of the festival fell on the 13th November 1868, and on the evening of that day the first case of cholera occurred. The man, a bullock driver and resident of Secunderabad bazaar, was taken ill with all the symptoms of cholera at the feast, and was brought back to the Secunderabad bazaar to die.”

“Returning again to Secunderabad town, we find the disease continuing in the locality where it broke out (Nullagoontah) and attacking 90 persons, of whom 55 died in the first fourteen days. The sanitary condition of this special locality was bad, but not worse than some other places which suffered less. In a former epidemic in 1866 it had been visited more lightly than many other parts of the town.”

“The cases of the two persons alluded to in paragraph 12, as having returned to Chudderghaut on the 14th November, and who were attacked on the 15th were followed by a lull, and no more persons in that locality appear to have suffered until the 23rd November, when 11 persons affected with cholera were brought under the observation of Dr. Wyndowe, the Residency Surgeon. Dr. Wyndowe notes in his report of these people ‘the whole of the eleven cases attacked on the 23rd, and 12 out of 13 of those attacked on the 24th, occurred amongst the caste of Marwarri people, dwelling in the portion of the Hashmat Gunj bazaar, most of whom had just returned from the Secunderabad bazaar where they had been present at a feast given by a wealthy sowcar who lived near Nullahgoontah, where cholera was prevailing.’ The total cases reported at Chudderghaut, was 135, and deaths 58. The population yielding these cases is said to be about 25,000.

“Before tracing the history of the cholera of 1868 any

further, it may here be remarked that the weight of evidence is in favor of *Nullahgoontah* in Secunderabad having been the real focus from whence the disease extended.

“The cantonment and station of Bolarum suffered very little, though the villages around were severely visited. The two cases in Chudderghaut on the 15th, were apparently insufficient to affect others. It was not until a body of men had proceeded to the Secunderabad bazaar, and feasted in a choleraic locality, that the infecting power of the epidemic became sufficiently developed. The proof of importation, as recorded by Dr. Wyndowe, is as complete as any evidence of this kind can possibly be.

“The cholera which had only begun to be epidemic at Chudderghaut on the 23rd November reached the opposite bank of the Moosy river, and entered the walled city of Hyderabad on the 24th. It spread very rapidly, and up to the 2nd day of January 1869, had caused 1,656 deaths. The epidemic did not finally die out, until some months later. It appears to have revived in the S.-W. monsoon months, and the total mortality recorded was 4,987.”

“But the first introduction of cholera into British territory does not appear to have followed the south-western route, but a course almost due south, along the high road from Hyderabad city, crossing the Kistna valley, below the confluence of that river with the Toomboodra. Cholera we have seen, prevailed on the Hyderabad portion of this route about the middle of December. For want of the means of tracing its progress southwards, we do not again hear of it until the 4th January 1869 when, in a village on the right bank of the river and distant some forty miles from the river, we for the first time, are enabled to track its course in the Kurnool district.

“The circumstances in connection with this outbreak, happen to have been accurately noted, and the history therefore becomes all the more valuable for record. They were as follows :—

The village of Noonipilly is a small hamlet or dependency

of the town of Nundial, which town is on the high road between Hyderabad and the railway station of Cuddapah on the N.-W. line, and is besides the centre of some local traffic. On the 3rd of January 1869, the headquarters and wing of the 19th Regiment Native Infantry, in marching from Samulcottah in the Godavery District to Kurnool, crossed this high road at a right angle ; and encamped near to the small hamlet aforesaid. Up to this date the route of the corps had been quite healthy. The other wing of the corps had traversed exactly the same route a fortnight before, had encamped on the same spot, and had arrived safe in Kurnool without any sickness. The districts from which the regiment had come (Godavery and Kistna) were absolutely free of cholera at, and after, this period. On the morning of the 4th January, the officers and men of the 19th Regiment pursued their way towards Kurnool in ignorance that anything was wrong with the health of the place they had halted at. On that very same day four cases of cholera occurred in the village. The villagers, naturally enough with their limited knowledge of the facts, believed that the regiment had brought the cholera to them. They knew that they had been healthy up to the date of the arrival of the corps, and that sickness had followed the arrival, and they did, as persons often do under such circumstances, look upon the arrival of the regiment and the outbreak of cholera as cause and effect, but that this was not the right explanation will be evident from the context.

“The 19th Regiment Native Infantry, moved on four marches nearer the end of their journey, and having on the 7th January arrived close upon Kurnool, the Commandant and Medical officer were astonished to learn that the corps had been reported to the civil authorities, as having left cholera at Noonipilly. Up to this time (7th January) the camp and followers of the 19th Regiment Native Infantry had been entirely free of cholera. As a precautionary measure it was thought best that the regiment should not move into Kurnool, but encamp for a few days in the neigh-



bourhood. On the evening of the 7th January the first case of cholera appeared in the regiment, and no other case occurred until the 12th. From the 17th the cases increased in frequency until the 27th when the epidemic declined. The attack of the wing of the 19th lasted for 29 days, and during this time the corps was kept moving about on the high plateau of ground to the south-east of Kurnool. During this time, many of the villages in the neighbourhood of the camp became affected."

"Quarantine, as might have been expected under the imperfect system of its application, failed to keep the disease out of the town of Kurnool, still it is worthy of remark that it took *twenty* days, from the time of the first case in the regiment, for cholera to reach the town, the villages all around being first affected."

\* \* \* "Cholera began in the Wallajah taluk in June, thence it spread to Arnee and Vellore. The first case occurred in Chittoor (the Zillah station of the district) on the 13th July. In the fort of Vellore on the 16th July. It is said to have been introduced into Chittoor by persons coming from Vellore. The prisoners in the Chittoor Jail were not affected although the disease did not cease to prevail in the station until the middle of October. Early in October three cases occurred in the Native Regiment at Vellore. The streams of pilgrims from Mysore, Cud-dapah and Nellore appear to have been all affected more or less by cholera, and the disease was known to be virulent at both upper and lower Triputti in August, September and October. The extension of cholera by the railway to Salem, Coimbatore, Bangalore and Conjeveram, was the most noticeable feature of the Triputti festivals. In the three former places cholera did not long survive the importation, but in the latter it assumed epidemic proportions.

"The district and town of Madras kept clear of epidemic cholera until the 2nd week in July. In the town some of the earliest cases were of cart men, strangers to the town, but the evidence of importation is not made out very clearly. It



prevailed in a village named Damal about the middle of July and in the neighbourhood (but not in the town) of Conjeveram and along the high road from Vellore and Arcot to Madras. Early in October some of the Conjeveram inhabitants went to the Triputti festival (in North Arcot) and returned with cholera, from this date the disease began to spread in the town of Conjeveram, where the deaths up to the end of the year were 110 or 3·4 per mille of population.

“The epidemic of 1869 in the town of Madras was not so severe as in the years of 1860 and 1866. It took however almost precisely the same course as those earlier epidemics, beginning in the western outskirts of the town and extending afterwards to Vepery, Pursewalkum and the more thickly populated localities of Chintadrepettah and Black Town. In all 568 persons died of cholera in the town of Madras in the year 1869. The mortality occurred chiefly in July, August and September. The deaths were in the ratio of 1·3 per mille of population.

“This epidemic is noticeable chiefly for the resolute measures resorted to for its limitation. When the disease was known to be approaching, arrangements were made in the Municipal and Medical departments for the supervision of the places frequented by travellers, and for the early segregation and treatment of the affected. Tents were pitched in convenient places for the reception and treatment of all applicants and a house was rented as a cholera hospital. Prepared medicines were distributed to the public by the passed and other students of Medical College, and when practicable cases were sought out and treated in their own homes. No such general measures for the care of the civil population had been adopted since the epidemic of October 1818. Whether the force of the epidemic was mitigated by the human action displayed on this occasion, may perhaps be an open question, but judging by the severity of former visitations it is only reasonable to conclude that the death rate may have been very considerably modified by the means resorted to.”

“A very local outbreak of cholera in Coimbatore, dependent on the carriage of pilgrims from Triputti, one of whom it is alleged either sickened or died in a railway carriage, which carriage was brought on to Coimbatore, is noticeable, for the reason that the stress of the disease was confined almost entirely to a dirty village which has sprung upon the outskirts of the railway station. The facts as recorded are briefly as follows :—

On the 16th September a man in a third class carriage travelling west from Triputti was seized with cholera and died, it is said, *in transitu* before the train reached Salem. This latter statement however is denied by the Railway officials. The carriage in which the disease occurred went on to Coimbatore, though whether it went further west could not be ascertained. It is quite certain that no disinfection of a carriage took place at the Coimbatore station, and it is probable (though not proved) that the carriage was swept out at the station, as all empty carriages are.

“On the 21st September the child of a Railway official at the station was attacked by cholera and recovered. In the four following days nine cases occurred. In a short time out of the small village of Potthanore and the neighbouring hamlets there were 71 cases of cholera and 40 deaths.”

“Mysore Province,—Epidemic cholera was introduced into the eastern taluks of the Bangalore district, according to the district authorities, by pilgrims dispersing from Triputti in September. In the town of Bangalore,—with a population of 52,649 persons—150 deaths occurred from cholera in September and October. In the Military cantonment, population 79,301, the first case occurred on the 8th September in a pilgrim from Triputti, who arrived by railway in a state of collapse. The carriage in which he travelled was crowded with people, and soiled by the discharges from his stomach and bowels.”

1870. The cholera continued during 1870 and forms again the subject of a special report on which is given a resumé of

the records of former epidemic invasions of the Madras Presidency.

“From all that I can ascertain malignant or epidemic cholera is not a natural product of Southern India. It is quite true that the very earliest records we have of the disease describe it as occasionally prevailing in Malabar, Arcot, Bellary and on the Coromandel Coast, and there can be no doubt that the whole of the peninsula, in times past, was subjected to invasions of cholera from the north, as in the year 1818, the invasion of which year is so graphically described by Scott, and in the more recent invasions to be presently recorded. But the fact of a disease being met with commonly in a locality is no proof that it is of endemic origin. When we come to examine into the life-history of cholera, as Dr. Bryden has done, we shall find that no conditions of soil or climate in this part of India are capable of perpetually renewing, what for want of a better term I shall designate, the contagium of the disease, and that, except in very rare instances an invading cholera never survives beyond four years, and in most instances is extinct in a much briefer period. In this respect cholera follows precisely the same law as small-pox, and possibly also some other epidemic diseases.

“It chooses by preference to occupy new ground, that is, it finds the fittest conditions for its growth among populations that have not recently been ravaged by cholera. It is affected more or less by seasonal changes during the natural course of its life ; active and deadly in its destructive powers at one period of the year under peculiar meteorological or climatic conditions, and dormant or inoperative at other periods, when a different order of meteorological phenomena prevails. Like small-pox, too, after a season of unusual and wide-spread devastation, it dies away completely, and is not renewed until a further invasion from without occurs.”

“Dr. Webster, of the 1st Madras Native Infantry, then stationed at Hooshungabad thus records the facts:—‘cholera appeared in the station about the beginning of February. There

was a large fair at the time in the station, the people forming the fair had come from a place where the cholera was, and there can be little doubt that they brought it with them. It raged violently in the city during the month of February, and notwithstanding every precaution was taken to prevent it, appeared in the Regimental lines in the beginning of March.' About the 20th February in this year the enormous crowd of pilgrims, assembled at Mahadeo in the Puthamaree Hills, was struck by cholera, and, in their dispersion, they scattered the disease far and wide. The city of Nagpore was affected about the 1st March, but the Military cantonment of Kamptee had presented isolated cases of cholera so early as January. Some marching corps of General Whitlock's (Sangor Field Force) in returning to the Madras Presidency were attacked, two days after coming in contact with a body of cholera-stricken pilgrims. It is unnecessary in this place to quote the details of the cholera diffusion north of Nagpore in 1860, but no one can read the report of Dr. W. A. Smith (quoted at page 410, *Madras Medical Journal*, Vol. I., 1870) without being impressed with the importance of the dispersion of the Mahadeo pilgrims in spreading cholera through the Central Provinces."

\* \* \* "At Cochin it broke out with great virulence in the native town of Muttoncheri, and in the Jail nineteen of the prisoners, out of forty, were attacked; yet, while the pestilence was ravaging Cochin in this frightful manner, the prisoners at Ernacollum, in the Native State of Cochin, about three miles away across the backwater, though overcrowded and exposed to many insanitary conditions, never had a single case. Cholera was less violent in South Canara than in Malabar, but it prevailed with some severity in most parts of that district."

"I had taken the precaution of warning the Collector that the appearance of cholera in the Museri taluk in November was likely to endanger the lives of persons at Sreerungum, and acting on this information the Collector was able to warn the people of the district of the risk of attending the



festival. Not more than 20,000 persons assembled on this occasion. Some individuals from Hyderabad, however, in marching back through the Kurnool district in January 1871, suffered from cholera, and communicated it to several villages in which they had encamped. This party had travelled from Trichinopoly to Gooty by railway. The Kurnool district, until this outbreak, had been absolutely free of cholera for more than eighteen months."

"By the aid of the District Police, early intelligence was conveyed to the Sanitary Commissioner of the movement of cholera towards Madura. Scattered cases had begun to occur early in January; and in the Pulney taluk the first reported death occurred on the 15th February. The Pulney festival took place from the 16th to the 25th of March, and was attended by about 20,000 persons. Cholera broke out in rather a virulent form amongst these people, when they immediately began to break up and disperse over the country. Sixteen deaths from the 16th to the 22nd were reported by the Police, and the Revenue officials note twenty-six cases, but it is evident that a great number must have escaped observation. After the dispersion of these persons, the report of cholera deaths in the neighbouring villages, and along the high roads into other districts became more numerous."

"Although the sanitary supervision of the Island of Ceylon does not fall under my jurisdiction, this would seem to be the proper place for noting that the epidemic, after invading the Tinnevely district, passed over to the north shores of the island, which were reached early in June. A local outbreak had occurred, however, in a village near *Point de Galle* so early as the 16th May. It would seem probable that the Galle cholera, and that on the northern road, must have reached the island by different routes. The particulars in regard to the development of cholera in Ceylon point, I think, most clearly to the influence of human intercourse between the southern districts of India and Ceylon, the localities affected being chiefly those on which coolies travel to and fro."

“The report of the Principal Medical Officer, Civil Department, Ceylon, is given below.”

‘I have had the honor to receive your letter, No. 253, of the 28th July, transmitting to me copy of Proceedings of the Madras Government, dated the 9th July, No. 850, on the subject of cholera in Southern India, and requesting me to report on the origin and progress of the present outbreak in Ceylon.

‘In explanation of the delay in forwarding this report, I have the honor to state that I awaited the receipt of the report, called for from the Colonial Surgeon of Jaffna, on the result of his visit of inspection down the central road from Jaffna to within a few miles of Dambul and on his return, striking off at Mattakachchee along the road to Mannar, which is frequented by the cooly immigrants proceeding from the coast to the interior of the island.

‘This report, with its explanatory maps, is now attached, and it affords a full detail of the origin and progress of cholera along the central road traversed by coolies on their way to the interior of the island, and on their return to the coast.

‘It also finally settles the question as to the origin of the disease, which has been recently raised by the Government Agent for the Northern Province.

‘The letter of the Sanitary Commissioner to the Indian Government, dated 1st July, No. 695, clearly states ‘that cholera had been prevailing in the southern Districts of India for some months past.

‘The disease became general in Tanjore so long back as October and November 1869. It then extended to Trichinopoly and Madura Districts, and lastly, to Tinnevely.

‘It had moreover prevailed in Tuticorin, in a minor degree, from 25th April.

‘With these statements, and the facts brought forward by Doctor Ondaatfe, no reasonable doubt can remain that the cholera which appeared in the north of the island and extended itself along the central road even as far as Matale and

Kandy—spreading, in a few instances, laterally to Anuradhapura and some neighbouring native villages, as reported by the headmen, locating itself in some of the bazaars, where the incoming coolies were in the habit of resting, and thence regurgitating backwards to Davipatam by means of gangs returning to the coast contracting the disease at the halting places resorted to by the infecting gangs recently arriving.—had its origin in the southern Districts of India, and not in Ceylon.

‘The first cases reported at Matale were coolies picked up on the road while proceeding towards the interior of the island on the 19th and 20th June, and the two first cases which occurred in Kandy were two Canarese, also on their way to the coffee districts who were found in a state of collapse in the cooly shed at Mahayawa, at a distance of a mile from the town on the 12th June, both dates being from nine to sixteen days subsequent to the first cases reported along the central road.

‘The disease extended in Matale and in Kandy to the inhabitants; but, although very fatal in its results, it limited itself to a comparatively few cases in both towns, and can no where be said to have assumed the form of an epidemic.’

*From W. C. Ondaatfe, Esq., Acting Colonial Surgeon, to the Principal Civil Medical Officer and Inspector-General of Hospitals, Ceylon, dated Colonial Surgeon's Office, Jaffna, 30th August 1870.*

‘Having completed my inspection of the cooly stations on the line of road traversed by the Indian immigrants from Pesalle, in Mannar, the port of arrival and departure to Allagamowa, on the boundary of the Northern Province, an extent of 102 miles, I have the honor to submit as required by the concluding paragraph of your letter of the 15th ultimo the following report which embodies the results of my inquiry as to whether cholera first appeared among the coolies arriving from, or returning to the coast of India.

‘Agreeably to your instructions I proceeded along the central road arriving on the 22nd July at Mattakachchee the point from which I commenced to prosecute my inquiry,

which I conducted, as far as circumstances permitted, in the mode here indicated.

‘The canganies and patrols who have the earliest opportunity of seeing the cholera patients, were required to be present at the enquiry, the former being directed to produce their lists of the names of the immigrants who had been attacked with cholera since its first outbreak during the present year. I then proceeded to take down evidence from them as to the name, age, sex, native country, and destination of each immigrant, and also as to the symptoms from which each suffered.

‘The statements thus obtained form the substance of my diary of inspection, which is hereto annexed, while the several stations inspected by me in the course of my inquiry are indicated in the maps attached to the diary and the position of each place where cholera appeared as well as of other places in which reference is made in the diary being shown by certain marks.

‘I communicated also on the several points of this enquiry with the medical practitioners employed by Government on this line of road.

‘It appears that the first cases of cholera, on the central and Mannar Mattakachchee roads all occurred on the same day, the 3rd of June last, in three individuals, namely, two immigrants and one patrol. It seems that a party of four coolies coming from Pnducotta, on the coast of India took shelter in the cooly shed at Periacatto, on the Mannar Mattakachchee road, 29 miles from Mannar, on the day referred to, on which day the patrol of the shed was attacked with cholera in the morning as also one of the 4 coolies, a woman who had come from Puducotta named Cammachy who was discovered having cholera symptoms on her while cooking her breakfast and who died at 5 p.m. of the same day. The patrol Periatamby also died about the same time.

‘Before the arrival of the coolies no cholera had existed in the place since the beginning of the year, and the only conclusion to be drawn is that they had communicated the infection, a conclusion which is strengthened by the following fact.



‘The first case on the central road occurred on the same day and in the same month, the 3rd of June, at Marndenheedaveli, 136 miles from Jaffna, in the person of a female immigrant who was one of a gang of incoming coolies. This leads me to believe that these immigrants, as well as those referred to in the preceding paragraph, had all come from one and the same infected locality, one party being in advance of the other.

‘Cholera next appeared at Teempanne, 128½ miles from Jaffna (intermediate between the two last stations), on the 4th of June. The patient in this case also was an incoming immigrant, a mason, and a native of the same place in India, Puducotta. It would thus seem decisive that the disease was imported in all the foregoing cases from the locality abovementioned, namely, Puducotta.

‘On the 7th June an incoming cooly from Salaputty, near Trichinopoly, and another belonging to the same gang were attacked with cholera at Allagamowa, 146 miles from Jaffna, but they both recovered, and were able to proceed to Kandy on the 11th of the month. The appearance of cholera at this station led to the infection being communicated, first, to the patrol who attended on the sick coolies, and next to a little girl who lived in the patrol’s house, and then to his wife. In all these three cases the disease proved fatal.

‘The next appearance of cholera was at Mattakachchee, 106½ miles from Jaffna, a principal station where the incoming and out-going coolies meet. The first case here was that of a Moorish girl, who lived in the bazaar and who sold certain articles the night preceding to immigrant coolies who had then arrived. She was attacked on the 11th June and died on the same day. Another case occurred on the 13th in the bazaar at the station, that of a dhoby who was living near the bazaar where the first fatal case appeared. A third fatal case occurred on the 13th in a road cooly, who also lived in the bazaar.

‘The bazaar people and the immigrants who halt at Mattakachchee, resort to a stream which issues from the tank in

the place, and which runs close to the road, for the purposes of bathing, washing their clothes, and for providing themselves with water for drinking and cooking. It is therefore, most probable that the contagious poison was communicated, in these instances, either by the water so indiscriminately used, or by intercourse with coolies.

‘Another instance of infection appeared on the 13th June, in a party of three Telegraph coolies. They were employed for some time on the central road where cholera had broken out since the 3rd instant, lodging in the bungalows occupied by the coolies. They had been in perfect health, till two of them were attacked with the disease when returning to Mannar, at a place called Callycattocaddo, which is about eight miles distant from that station.’

‘From enquiries I made at Maunna, from the oldest inhabitants of the place, it appears that cholera was introduced among them originally by natives of India crossing over to Talamannar, whence the tappal formerly passed over to Tinnycuddy, in Ramisseram and India. Passengers to Ceylon came by the tappal boats by the same route, as also pilgrims from India, by whom the disease was brought into Talamannar, whence it spread to Pesalle and to the town of Mannar, passing on to Vengala and other places on the mainland. Mr. Bulner, who was Sub-Collector at Talamannar from 1849 to 1859, informs me that it was the general belief that the Indian coolies and pilgrims were instrumental in importing this fatal disease. Gangs of coolies first commenced to come over to Ceylon in 1837. Mr. Bulner recollects that in 1843 cholera first made its appearance at Talamannar with the immigrant coolies proceeding to Kandy, and that it prevailed subsequently in an epidemic form. Coolies had been passing backwards and forwards through Mannar for upwards of thirty years, but no measures were adopted for their protection till 1862, when the immigration service was organized by Government.

‘In consequence of the introduction of cholera, the population in several villages in the vicinity of Mannar has been

considerably reduced in number, as testified to by the Assistant Government Agent of Mannar in a communication addressed to the Jaffna Cholera Commissioners, dated 15th April 1867. I quote his own words. Mr. Twynam says: year after year has sickness been introduced by the immigrant coolies, and village after village has died out, or been so reduced that only one or two families remain, and the country, for some distance on each side of the Mannar Madawaratchy road, in the Mannar District, is fast becoming a desert.

‘I must confess that I regard with some degree of surprise that any question should have been raised by the authorities in India as to the importation of cholera into India from Ceylon, when it is universally acknowledged in this province that the disease is brought from the coast of India, the birth-place and head-quarters of cholera.

The Cholera Commission appointed by His Excellency the Governor on the 3rd March 1867 to inquire into, and report upon, the causes which led to the outbreak of cholera in the Jaffna Peninsula, after an extended inquiry express themselves in the following terms ‘We have established beyond doubt the facts of its having been introduced into the Peninsula from India, both directly by sea and more circuitously by the central road and of its having spread from village to village by human intercourse, thus confirming the opinion, now generally entertained, respecting the transmissibility and mode of propagation of cholera.’

\* \* \* “We gather from this record that cholera was scattered far and wide over the country by the pilgrims returning from Conjeveram. The facts have been recorded by Mr. Price, not to support any theory, but simply with the view of describing occurrences coming under his own observation. The story of the Triputti and Conjeveram pilgrims in 1870 is true of all, such bodies of human beings, in relation to cholera, in all other years when a new invasion or re-production of the disease takes place, whether the facts be ascertained and recorded, or whether they be left unnoticed.

To argue that cholera in seasons of re-production or invasion is not aggravated by the assemblage of crowds of human beings at the religious festivals of the country, is to ignore plain truths that the people themselves admit to be unquestionable."

"The Nilgiri Hills. In all the years since our occupation of the elevated plateau of the highest portion of the Western Ghauts, there is no record of a cholera wave affecting the resident population. The Hill tribes hold but little intercourse with the low country, but the European settlements have attracted a numerous semi-resident population of pariahs, and other classes from the plains, and a considerable traffic goes on between the Coimbatore district and the Neilgherries on one side, and the Mysore country on the other. The approaches to the hill stations by both roads are practicable for wheeled conveyances. With such an amount of traffic as there is between the hill stations and the low country, it may reasonably be thought that cholera would find its way occasionally to the cool and temperate region of the mountain plateau, and practically this is the case. As a portion of the general inquiry regarding cholera, I have thought it right to examine the records in the office of the Inspector-General, Indian Medical Department, from the epidemic invasion of Southern India in 1859, down to the present time, to see upon what basis of fact the often-repeated assertion rests, that cholera is unknown on the Neilgherries. The facts, I believe, are of the same order as those noticed in regard to the Shevaroy Hills. The disease has been often imported by travellers, but there is nothing in the accumulated evidence to lead us to imagine that cholera has sprung up from an aerielly conveyed "germ." The sanitary condition of the native bazaars at the hill stations has been, and still is, far from satisfactory, and the wonder is that cholera has not, on many occasions of importation, taken firm root in them. Practically it has not done so, except for a very limited period during the year 1866. In a matter of this kind, I shall appeal only to re-



corded testimony of the Medical Officers who have served tours of duty on the hills.”

“The Coonoor Medical Officer, Dr. G. S. W. Ogg, writes: ‘several cases of cholera occurred in the station during the year 1866. The disease can hardly be said to have prevailed in an epidemic form; but, as cholera has rarely if ever been known to spread when introduced into Coonoor from the low country, before this year, it may be well to take notice of the outbreak. The epidemic originated at a place called Kurmathanputty near Coimbatore, during the celebration of a Roman Catholic festival. Many natives had gone from the hills to be present at the festival, and on their return it was observed that the disease broke out at Goodalore and Mettapolliam, and other places on their route.

‘The first cases in Coonoor were found in every instance but one to have occurred in persons who had lately returned from Kurmathanputty, or from the low country, having passed through Goodalore or Mettapolliam. Most of those persons were attacked on their way up the Ghaut, or in the night after their arrival. The single exception occurred in a young man who was attacked immediately after his arrival from Kotagherry (a small hill station twelve miles distant), where he had come in contact with some travellers from the low country. The first case of cholera in Coonoor occurred on the 8th October, and the last on the 24th October 1866. During this period 18 persons were attacked, and of these 8 recovered.’”

“Ootacamund. Mr. Furnell, the Medical officer, reports the extension of the October cholera at the Catholic festival in the plains to Ootacamund, as follows:—

‘During the month of October, a Roman Catholic festival takes place at Kurmathanputty near Coimbatore, and numbers of devotees from these hills and the surrounding districts flock to the spot. An epidemic of cholera it seems made its appearance amongst the crowd assembled, and the people composing it immediately fled to return home. Many people (eight) were brought into Ootacamund in doolies or

munchheels suffering from cholera, and were seen by the Dresser and myself. Most of these recovered, and so rapidly that many entertained doubts whether they had been cholera cases at all. *However, the sister of one young man who had been brought in from the low country, and who had nursed the brother in his attack, from which he recovered, was seized with unmistakable cholera and expired. She had not been out of Ootacamund. A neighbour also, a woman, and who had not been to the low country, was seized and died. Having thus shown its communicability the cholera stopped.* Since then there have been one or two cases, one notably in a horse-keeper of the Livery Stable-keeper here, but of whose history, as to whether he had been out of Ootacamund or not I could obtain no reliable information. There were 12 cases and 6 deaths in the Civil Dispensary.' "

"Madras—Conjeveram—festival in May. Cholera had been prevailing at the place of assembly from October to February 1870. It broke out again in May during the feast, 33,000 persons attended the festival. The dispersion of pilgrims from this site, and from Triputti, was followed by a wide development of cholera over the North Arcot, Madras, Salem, and South Arcot Districts; sanitary measures carefully supervised at Conjeveram; water-supply during the feast scanty and of doubtful quality. The temple tanks are used for washing and bathing, and the people drink freely of the same water.

\* \* \* "The intensity of cholera, and the prolongation of its epidemic visitations, are, I am convinced, largely due to the habits of the people in gadding about to divers places where festivals are held, and by their unnatural modes of living during such seasons of festivity.

"The interests of the Managers of Hindu Temples are frequently adverse to those of the Government, in dealing with the dangers which arise in regard to cholera invasion. The pecuniary interest of the temple authorities are at stake in inducing large gatherings of people at their periodical festivals, irrespective of the presence or absence of

epidemic disease in the district. It would be to the interests of the State, and of the people themselves, to prevent such assemblages in seasons of epidemic sickness. It is now practicable to forecast, with tolerable accuracy, the results, as regards cholera outbreaks, at these annual festivals in the several districts, and it seems to me that the time is fast approaching when the subject may be dealt with by the Legislature, in such a way as to compel the parties interested in keeping up the system of pilgrimages to take upon themselves the responsibilities of sanitary provision for the assembled masses, and to enable the Government, on sufficient cause being shown, to forbid altogether the holding of festivals, in seasons when the public safety is likely to be endangered.

“ If Mr. Overbury’s remarks, quoted below, in any way represent the true feeling of the better educated of the Hindu community, they must be, in a measure, prepared to welcome State interference in a matter of the gravest significance as regards public health.

\*            \*            \*            \*            \*            \*            \*

‘ From this brief history it is shown, beyond all doubt, that we are indebted to Conjeveram festival for our recent loss of lives by cholera. Were this, however, inaccurate in the particular case of Tripatore, I speak from experience of former years in this district, Onddalah, and elsewhere, that Triputti and Conjeveram are the originators of this pestilence.

‘ There are two festivals annually held in my division at Tirtannally, and at Irulapatti. At each about 2,000 persons congregate. The frequenters are Vellalas, Pallees and beggars.

‘ I cannot say that there is no cholera which is endemic, but I can safely affirm that it is chiefly epidemic. The only cure is the abolition of the festivals of Conjeveram and Triputti. And this I would request of you to urge on Government. From frequent conversations with the Natives, and from observation, I am convinced these festi-

vals are losing their characteristics as religious ceremonies ; they are regarded by most in the light of fairs, and by beggars as a profitable lounge. Natives who are educated and wealthy rarely attend. As for the minor festivals, such as those held in my division, I would not suggest their abolition, as they are sufficiently rapidly, of their own accord, dying a natural death.

‘ With regard to the two larger festivals, however, the Natives are becoming aware of the concomitant evils which follow in their train, and the wiser of them stay at home. By their abolition, the sacred character of the locality in the eye of the Hindoos could in no way be impaired, as the May festival might be celebrated as before, the concourse of people at one spot only forbidden.

‘ Should, however, the Government decline to sanction their abolition, a strict quarantine, perpetually established at these places, superintended by Medical subordinates, and paid for out of the Devasthanam funds, should be rigorously insisted upon, as it is inconsistent with civilization that a surging wave of sickness should be annually propagated for the gratification of the few.’ ”

The year 1871 was not noticeable for any general prevalence of cholera in the Madras Presidency—but the history of some localised outbreaks, freely reported by the Sanitary Commissioner of Madras, throws considerable additional light on the spread of cholera by human intercourse.

“ The first local outbreak I have to remark upon was one of considerable interest, as it occurred in a part of the Kurnool district, where there had been no case of cholera for upwards of 18 months. The place, I am glad to think, was visited by Dr. D. D. Cunningham very shortly after the cholera outbreak, and a description of the village will be found in that officer’s report, Appendix B., page 180 of the report of the Sanitary Commissioner with the Government of India, for 1870. The following summary of facts is given by Dr. Cunningham : ‘ According to information derived from the office of the Assistant Collector of Kurnool,



a party of about 50 pilgrims (the Tahsildar's report says 100—W. R. C.) returning slowly in bullock bandies from Sreerungum (the shrine near Trichinopoly) to their homes in the Nizam's territory, arrived at Kottapully on the evening of the 23rd January. They had left Sreerungum about 20 days previously, just at the close of the festival. There is no evidence showing that they suffered from cholera previous to their arrival at Kottapully, and there was no cholera known to exist at that time in any of the villages on the road which they had traversed between Ghooty and Kottapully. They remained at Kottapully until the morning of the 24th, and during their stay three of their number were attacked with cholera but were taken with the rest when they left to proceed on their journey. Two of these died in the course of the day's march, and were thrown down by their friends at the side of the road of Yeldurti, a village between Kottapully and Kurnool, while the third recovered. No other case occurred amongst them while in British territory.'

"It will be seen by this account that the pilgrims, who had undoubtedly been in districts (Trichinopoly and North Arcot) where cholera prevailed, arrived at the village on the 23rd January, (another account in my possession gives the date as the 22nd January,) and on the morning of the 24th three of their number were seized with cholera. On the following day, the 25th, no fewer than 41 of the residents, according to the returns of the district police, were attacked. Up to the 1st February the police returned 60 cases, occurring in this and two neighbouring hamlets, and 26 deaths. The disease did not spread beyond the immediate neighbourhood of the village, and these deaths, in fact, whether they were 26 or 18, constitute the total cholera mortality recorded of the Kurnool District for the whole year."

"The facts in this particular case then, divested of all verbiage, simply show that a body of travellers, who had been exposed to choleraic influences for an uncertain

number of days previously, had a few of their number attacked in a village and district where cholera was completely absent, and that the outbreak amongst the travellers on the 24th was followed by a sudden explosion of the disease on the 25th in the particular village and surrounding hamlets where the travellers had been attacked while halting, and nowhere else."

"Cholera was prevalent in the North Arcot District, all through the month of January 1871 and 218 deaths were reported. The exact date of its outbreak in Calastry appears to have been on the 5th February. Up to the 8th there had been four fatal cases in the town. On the 14th, the first day of the feast, another death occurred, and between that date and the 27th there were 37 more fatal cases. The resident population of Calastry is about 6,500 and during the festival there would be a considerable addition to the population. Some sanitary arrangements were made for the cleanliness of the town during the festival, but the cholera being already located there before the assemblage of strangers, the outbreak could not be prevented. A Medical subordinate attended to such of the sick as sought his aid.

"From this Calastry festival it is evident that cholera was widely distributed by pilgrims.

The Collector of the district writes (18th March 1872) 'there is no doubt that the pilgrims departing from the late feast have carried the disease into other parts of the district, and one man, who was known to have been at Calastry during the feast, has died of cholera at Triputti.'

"The Superintendent of Police, whose attention has been specially directed to the subject of this outbreak, reports that in four villages, of which the particulars had come to his knowledge, outbreaks were distinctly traceable to Calastry, the first victims in each case being persons who died soon after their return from thence. In two villages the victims were limited to the individuals who had been at Calastry. A single case in the village of Rogagnūta is

said to have been traceable to the fact that a person from Calastry lodged in the house, the lodger dying subsequently of cholera."

"The history of the extension of the disease to the town of Cuddapah is however better made out. It is absolutely certain that two men arrived in the town from Calastry on the 24th February. Both were taken ill of cholera the next morning, and died on the 26th. On the same evening the Zillah Surgeon reports 'two of the regular inhabitants, living next door to the house where the travellers from Calastry lodged, were seized, and died the same day.'

"The epidemic thus established in Cuddapah progressed throughout the town and neighbouring villages. It reached the jail on the 7th March, causing two deaths in that month and two in April. The first person attacked was a debtor, and the second a prisoner sentenced to twelve months imprisonment. No direct communication was traced, but it may be noted here that the water-supply of the jail was the same as used by a large proportion of the population. This was drawn from an open well, into which hundreds of people walked every day with dirty feet, to dip for their daily supply.

"Before the end of the month of March cholera had appeared in thirty villages in the Cuddapah district, but out of these nine were in the Cuddapah taluk, thus showing the great probability of the extension of the disease mainly from the new focus which had gained strength in the town of Cuddapah. The Police reported 46 deaths in the town during the month, and the same number is given in the Municipal return for the month of March. The number of cases treated by the Medical officer in March as in and out-patients of the dispensary was 138, and of these 33 are reported to have died."

"Early in March my attention was attracted to the increase of cholera in the town of Madras, and to show how distant places may be influenced by cholera outbreaks at



native feasts, I think it is important to quote here from a letter addressed to me by the President of the Municipal Commission. I had advocated the tracing out of every case in the town of Madras, and the disinfection of each house or building as soon as ascertained. Mr. Loch says (13th March) 'with reference to the three persons who died in one house, I am informed that about twenty days ago a friend was staying in the house, who had arrived from Calastray, suffering from cholera caught on the road. He recovered and left the house, but two days afterwards one of the family, a man aged 22, was taken ill, and shortly afterwards the two others.'

"I have no further particulars in regard to the extension of cholera from Calastray, and for the simple reason that it is impossible for one individual to follow up the history of each outbreak; but those already given are sufficient to show how widely an epidemic movement may spread in the wake of human beings who assemble at infected localities."

"On the 23rd May a second party of travellers (cart-men) arrived at a village close to the Hussar barracks and lines. They had come along the eastern road, and, from their own account, had contracted cholera near the Kistna river, probably at Juggiapetta or Sooriapett, which disease has caused considerable mortality amongst the party. There were two cases of cholera in the camp when the carts were halted at the village of Chickalgooda about half a mile from the Hussar barracks, and somewhat to the south and east of them.

"On the evening of the following day 24th May, cholera broke out with great virulence in H. M.'s 18th Hussars, there being 35 attacks within twenty-six hours. In the day and evening of the 24th there occurred also five seizures and two deaths amongst the Native inhabitants of the bazaar.

"When the Special Report on this cholera outbreak was drawn up, I had no information to show what the condition of the country between Juggiapett and



Hyderabad was, in regard to cholera. But I had tracked the progress of the disease up to the frontier limits of the districts of Nellore and Kistna, and had shown its prevalence both on the Eastern Coast road and on the Madras road, *viâ* Ongole, so that I had no difficulty in concluding that the portion of the Nizam's country between Hyderabad and our frontier, along that main road, must have been affected prior to the actual outbreak in Secunderabad.

"And recent information has satisfactorily confirmed this. Doctor C. Barclay, in his interesting account of the Secunderabad cholera, published in the *Madras Medical Journal* for October 1871, says that, in the week ending 13th May, cholera was prevalent in the Cummumpett and Nalgoonda Division, of the Hyderabad State, though the information reached him only long after the date of the cholera outbreak at Secunderabad. Now the Cummumpett Division adjoins the Nandigama taluk of the Kistna District, where we had traced the movement westward from Bezwada early in May, and the Nalgoonda Division lies between Cummumpett and Hyderabad, and both districts are traversed by the Eastern Coast road.

"Dr. Barclay remarks: 'In the village of Sooriapett especially, distant about 80 miles from this, and through which the road appears to pass, (it actually does.—W. R. C.), 78 deaths from the disease were reported during the week in question.'"

The report of 1872 contains nothing bearing on the subject of our enquiry; but the report for 1873 contains this singular case.

"It is worthy of remark that this same steamer *Assyria* before arriving at Madras touched at the port of Nizam-patam (Vadurevu) in the Kistna district on the 28th August while choleraic diarrhoea was prevailing amongst the emigrants, and stayed there one day, landing rice and other cargo. No passengers were landed, but coolies from the coast villages were employed in landing cargo.

“On the 15th September cholera deaths were reported from a hamlet in this neighbourhood, and it was thought by the people themselves that the disease had been brought to them from a fishing village in the Nellore district, but subsequent inquiry on the part of the Nellore officials showed that there had been no cholera whatever in this district at the time referred to, so that the theory of importation from a neighbouring district falls to the ground. On the 20th September cholera broke out in Vadurevu, the village connected with the port of Nizampatam. It spread to the town of Bapatla a few miles inland on the 27th September, and to several other villages in the neighbourhood, and finally died out in November.

“The local authorities I may state do not seem to think that communication with the *Assyria* had anything to do with the outbreak, but the fact that cholera should appear in a locality, some of the people of which had had communication with an infected ship, *and no where else, along the many hundred miles of the Carnatic Coast*, is not a little remarkable. No satisfactory inquiry could be instituted in regard to the history of the persons who had been on board and landed cargo, nor of the first cases of the disease, but it is clear from the history, that the cholera was of the usual epidemic type, though limited in the area of its diffusion.”

The mortality from cholera during 1874 was even more insignificant than during 1873. During 1875 cholera of not very severe type was prevalent in many parts of Southern India it continued during 1876 the sufferings of the people being much aggravated by the severe famine which now set in; during 1877 the famine and cholera reached the maximum and no less than 357,430 people are reported to have died from cholera. There is nothing in the reports for 1874-75-76-77 bearing on the question under investigation.

During 1878 deaths from cholera were very few in number compared with the awful mortality in 1877, but we find the following interesting account of a renewed outbreak of cholera in the Bellary district.

“The circumstances of the renewed outbreak of cholera in Bellary are peculiar and deserving of notice. Cholera had been prevailing in this district in 1877, but had entirely disappeared in September of that year. Not a case was heard of in the entire district until 18th April, when two deaths were reported in villages of the Hospet taluk near Humphi; a festival was going on at Humphi at this time. This festival is visited by many persons from the southern Mahratta country and Bombay Presidency, as well as by the Bellary population. Deaths from cholera were reported from Humphi, Hospet and Chithanadigi on the 19th and 20th. Before the end of the month of April 251 deaths had occurred in the Hospet taluk. Seven deaths also occurred in Bellary Municipal town, 1 in Bellary taluk, 21 in Allur, 4 in Adoni, and 2 in Sundur. The main stress of the epidemic in this month was confined to the taluk in which the annual fair was being held, and there can be no reasonable doubt that the disease was imported into the Humphi fair. The Deputy Collector in reporting the occurrence distinctly states cholera appeared yesterday in epidemic form in the town of Hospet *amongst those who have returned from the Humphi festival*, in which place I hear two cases have occurred.

“The principal day of the festival was 17th April, and on this date about 30,000 strangers were assembled at Humphi. The Hospital Assistant who was detailed for duty on the occasion states :—

‘Until the 19th April the place was healthy; on the 20th, when most of the pilgrims and bandies had left the station, cholera made its appearance. A Mahomedan bazaar man who had been to the feast at Narraickary, whence he came direct to Humphi, was the first attacked. Within four days 7 deaths were recorded from cholera at Humphi.’

“The statistical facts shew that until the concourse of strangers at Humphi there was no cholera in the district, that the 17th April was the principal day of the festival, that



on the 18th two cholera deaths in a village and close to the site of the festival took place, that cholera broke out at Hospet among the persons who had just returned from the fair, and that within the month cholera deaths had occurred in 22 villages of the Hospet taluk.

“If the assemblage of a crowd from various countries and an outbreak of cholera amongst them be merely a coincidence, it is a very curious one. It must be remembered that there was no cholera known to prevail anywhere within the Ceded Districts at this time. But if the contagium of the disease was not in some shape imported on this occasion, I am at a loss to account for the outbreak. The weather was fine, and there was nothing unusual in the conditions of the locality to account for the outbreak.

“The total cholera mortality of the district was 4,626. In April the mortality was almost entirely confined to Hospet, in May it had extended to 16 out of 19 registration circles of the district. From July the mortality rapidly declined, and in December the district was entirely free.”

The years 1879, 1880, and first part of 1881 were years of singular freedom from cholera in Southern India. Towards the close of 1881 however a cholera wave leaving its endemic home took the usual road through Central and Western India and began to make its way towards the Madras Presidency. Its advent was foreseen and accurately determined. The Surgeon-General forecaste its advent and warned all Medical Officers to be prepared for it. Here are the notes from this year's report.

“As foretold, cholera invaded the Madras Presidency towards the close of 1881. It was gradually making its way down from the Deccan when a feast at Triputti in North Arcot suddenly gave it an impetus, and sent it with its dispersing pilgrims into every collectorate of Southern India.

“During the early part of the year returns showed it to be rife in the Bombay Presidency, and that it was making its way down towards us. In August we have the first



return from Raichore\* of a child in the house of the railway people, and on inquiry it was ascertained several cases had occurred amongst the inhabitants of that town which is under the sovereignty of the Nizam.

“Triputti, October 2nd. The next cases came from Triputti in North Arcot, a town famous for its temple, situated in the same line of railway as Raichore. The cholera made its appearance here on October 2nd, and the first report told of five cases, three of which were fatal. In answer to an inquiry from the Sanitary Commissioner, the Collector reported as follows :—

‘The festival it seems went off very well, but unfortunately at its close cholera suddenly broke out on the Triputti Hill; first amongst the pilgrims who had come from the Central Provinces; then pilgrims of this Presidency were attacked, and afterwards as the latter were returning to their homes they spread the disease in various parts of this district. Amongst the early cases were those of a person from Coimbatore who died on the Triputti Hill itself; one from Madura who was attacked while in the railway train near Tirutani and died at Arkonum, and of another who died at Panapak on the road from Triputti to Chittoor. One of the pilgrims also died of cholera at Palmanair on his way back to Mysore’

“It spread from this gradually over the district of North Arcot, making its appearance in Vellore, October 26th, and Chittoor, October 20.

“Madras, October 6th. The next place in point of time where the cholera showed itself was Madras, also on the direct line of railway communication with Raichoor and Triputti. Here a case occurred, October 6th, and in answer to inquiries from this office, the Vice-President thus writes :—

‘The woman came from Triputti and brought the seeds of the disease with her.’

“South Arcot, October 8th. Next in point of time comes Puttur in the Virdachellum taluk, where it showed

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\* Raichore is a Railway Station half way from Bombay to Madras.

itself on the 8th of October ; 2 cases occurred which proved fatal. The Deputy Collector thus writes :—‘ It appears these were pilgrims to Triputti where they caught the contagion. On their return home by the time they reached Villupuram they became worse and died after they reached their village.’

“Salem, October 11th. Salem was the place from which we next get returns and where for some time the cholera raged with great virulence. The first person attacked was a young police constable who had been in the police for two months in Salem and who had not been out of the place since his enlistment. He lived however in a chuttrum in the centre of Salem where travellers resort to. The Zillah Surgeon writes :—‘ I think it probable that he may have been infected by some one returned from Triputti, where cholera is reported to have prevailed but no evidence of any returning pilgrims having stayed there can be obtained.’ The Collector also writes subsequently in his report to Government (G. O. No. 1561, dated 18th November 1881) :—‘ It was afterwards ascertained that on 7th October a party of Malabar brahmins returning from Triputti feast alighted from the 7-25 P.M. train at Suramungalum and went to the Local Fund chuttrum near the station where one of their number was found to have cholera. Some of his companions applied to the Railway Apothecary who gave them medicine for the patient but did not visit him. He got better, (this man subsequently died at Coimbatore) and the whole party proceeded on their journey by the 3-20 A.M. mail train the same night. A party of Salem weavers (Kaikalars) returned from Triputti by the same 7-25 P.M. train and having put up for the night at the chuttrum went into Salem the next morning. I have not been able to trace these people but I think it is as probable as not that the disease was introduced into the town of Salem by others. I have no doubt it came from Triputti and there were many returning from the feast at this time who may have brought it with them. It will be observed

however that of the first six cases five were Musulmans.'

"Chingleput, October 12th. In the Chingleput Collectorate it made its appearance October 12, having been, the Collector reports, imported from Triputti.

"Bellary, October 14th. Bellary was visited October 14th by a very smart outbreak. It made its appearance in a part of the town called Millerpett, chiefly inhabited by Musulmans and peons, and although inquiry on the part of the Revenue officials failed to connect the outbreak in any direct way with Triputti, the Collector remarks in his report:—'A large number of the people of this town had been to Triputti, and it seems very probable that cholera was introduced thence although the channel cannot be traced.'

"Trichinopoly, October 19th. From Trichinopoly we have the first case reported as occurring on October 19th. A cart owner of that village who had gone to Salem was attacked on his way home and died on reaching his village.

"Coimbatore, October 20th. The date of the first case in Coimbatore, October 20th, in a man returning from Triputti to the Western Coast. It is believed to have been the person who taken ill at Salem, was put into the train after treatment; but becoming again very ill, was taken on to Coimbatore where he had friends and where he died:

"Cuddapah, November 7th. In Cuddapah there occurred a case on November 7th and the Collector reports: 'The deceased, aged 40, a fireman residing at Triputti, came to Cuddapah station at 8-30 P.M. on the 5th instant: he died on the morning of the 7th.'

"South Canara, November 12th. The most interesting account comes from Canara, and is a singular history of how far apparently this terrible scourge can be spread by pilgrims returning from an infected place. Sixty people set out on a pilgrimage from Karkal, in the Canarese country, for Triputti, and remained there three days. On their return they split up into two parties and returned, *viâ* Bangalore

and Seringapatam, at the latter place one of the companies became attacked by cholera, and a woman from the other company visited the sick person and administered remedies. She rejoined her company, however, which immediately set off in haste for Canara, whilst in the Ghauts the woman who had acted the part of a good Samaritan became a victim to cholera, and then it broke out amongst the rest who became so alarmed that they scattered and fled each one for himself, *sauve qui pent*, for their homes.

The report for 1882—although it deals with a year in which much cholera existed it contains nothing bearing on the point under investigation.

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## BOMBAY.

1864. The first Sanitary report for Bombay is, like that of Bengal, for 1864 : in this it is suggested "that pilgrims returning from a jutra (pilgrimage) at which cholera has appeared shall not enter any military cantonment or any town until after reasonable evidence that they are free from infection. The evidence required being that they are free from diarrhoea or other signs of the disease, and that two whole days or full forty-eight hours have elapsed since they were in personal communication with, or in society of, a person ill with cholera or diarrhoea."

From 1864 to 1874 there is literally nothing in the reports which bears upon the question of communicability of cholera by human intercourse. The writer or writers of the reports in question confine themselves simply to stating that during the year under review so many cases of cholera occurred with so many deaths. In the report for 1875 the following occurs—

"During April there were 959 attacks at Nasik and 481 deaths, and it now appeared in other districts.

"Taking Nasik as the centre of infection, or revival, it would be extremely interesting to trace the course of the disease through the several districts in which it appeared, but the means are not forthcoming. Very excellent reports have been received from Nasik, Kaira, the Panch Mahals, and Ahmedabad ; but in these even there is not the requisite precision as to dates. When the outbreak first occurred there were then taking place numbers of caste dinners, wedding feasts, &c., and then came the Holi with all its excesses ; so here were causes for the bad form of diarrhoea which was said to be prevalent."

The following relates to the agency of human intercourse. "In the Kaira district there was no cholera, but it was at

Baroda. One of the Municipal Commissioners of Nariad, in the Kaira district went to Baroda, was attacked immediately after his return home, and died, and the disease then spread through the town. In the Borsad taluka a man was attacked after visiting Nariad : six others of his household were attacked, and all seven died. There was no other case in the village, nor was there anything in the condition of the house or its surroundings, different from other houses. From the Nariad and Borsad talukas it spread over the entire district, and appeared erratically in village after village. The one fatal case in Ahmedabad was brought by railway on the 29th April from Anund in the Kaira district. On the 17th it appeared in the Panch Mahals, in the Kalol taluka, and here it is said, to have been imported from Baroda and Kaira."

In the report for 1876 we find as follows :—

"Some interesting accounts of outbreaks of cholera have been received during the year from district officers. Among such I may particularly notice that of Mr. Stewart, the Collector of Kaladgi, the following extracts from which are noteworthy.

\* \* \* 'It was first introduced, as far as can be ascertained, by human contagion, and that was in a great measure the agency by which it spread itself. It had, however, a decided direction, and no human contagion appears to have availed to carry the germs of the disease out of the direction which it adopted. From July to November it swept southward ; from December to February it appears to have been paralysed by the cold weather ; while from March to June it rolled northward with a returning wave. Its course, in the direction it took, was zigzagging, sometimes appearing in a village to the right and sometimes to the left. It would be impossible to trace clearly the way in which one village was infected from another ; but in these parts, where the country people repair once a week in large numbers to market towns, it is easy to see how the infection might have spread and been carried unconsciously to

many a remote village or hamlet. The disease was very capricious in its attacks. Villages notoriously dirty and squalid were spared, while others equally known for cleanliness were attacked; large towns with a thickly packed population enjoyed a comparative immunity, while small villages suffered badly. The disease generally appeared very suddenly and without any premonitory warnings, striking down on the first day a certain number of persons, generally from ten to twenty, and proving fatal to about half the number. It then either left the village or lingered on for a few days longer before it took its departure elsewhere. The outbreak in this district will, I think, be remembered more from the number of villages attacked than from any other feature. The following statement will show how widely the infection was spread.'

Taluka.	No. of vil- lages.	No. in which cholera pre- vailed.	Total deaths in Taluka.	Average deaths per village.
Bagalkot.....	174	55	556	3
Badami.....	209	49	475	2
Hungund .....	169	74	540	3
Indi.....	126	25	783	6
Sindgi.....	150	68	1,051	6
Bagewari .....	121	35	642	5
Bijapur.....	101	24	664	6
Muddebihal .....	154	34	625	4

In the report for 1878 we find the following :—

\* \* \* “ In July there was a still further diminution; but it now appeared, for the first time, in the town of Pandharpur. Here there were 220 seizures, and they all ended fatally, the population being 16,275 the ratio of deaths was 13·5 per 1,000. As regards this outbreak it must be remembered that it occurred during the great Ashadi Jatra, when 55,000 pilgrims were assembled from far and near. The opening and closing days were the 10th and 20th July, and cholera broke out on the 13th and lasted till the 21st. Mr. Narayan Anant, the Assistant Surgeon

at Pandharpur, says, in his report, on the Jatra : ‘ There was no disease of any kind till the 10th—the chief day of the fair ; but on the following morning reports were received that 3 persons, 2 natives of Karwar and 1 of Nar-sobas-wari, near Miraj, were taken ill ; of whom 1 had died. Medicines were administered to the remaining 2, 1 of whom recovered, and the other died seven hours after. The number of attacks from cholera went on increasing till the 14th, after which it continued to fall as the pilgrims disappeared.’ ”

In the report for 1880 we find this entry. As regards the December outbreak the Collector of Ahmednagar writes as follows :—

“ One man out of a certain number of pilgrims belonging to the villages of Heewargaon, Pansa and Bota, in the Sangamner taluka, was attacked with cholera on the 5th December at the village of Ale, in the Jamner taluka of the Poona district, while the pilgrims were returning from the Alandi fair in that district. These men halted at Bota, a village in the Sangamner taluka on the Nasik and Poona road, on the 5th. Those that belonged to Heewargaon Pansa proceeded to their villages early in the morning of the 6th December, on which date 4 men belonging to Bota were attacked ; of these 2 died on the same date, and the other 2 recovered. On the 7th 4 were attacked, of whom 2 died on the same date, and the rest recovered. One fresh case occurred on the 10th and one on the 11th, both these proved fatal. At Heewargaon the man who was first attacked recovered, but the other men belonging to the village attacked, died, &c.”

In 1881 we find :—

“ On the 19th August the first case of cholera appeared in Shedbal, a village in the Athni taluka of the Belgaum district. A week afterwards, it spread to three other surrounding villages, and the attacks and deaths for the month were 175 and 60. The disease is said to have originated in the Athni taluka and was afterwards conveyed to Chikodi,



from whence it was brought to Yankammardi by persons who had visited a fair in the cholera districts."

\* \* \* "In October it was in three villages, 2 in Muddebihal and 1 in Bagevadi talukas. The Sindgi village officers ascribed the outbreak to the fact that, at that time, travellers came from Sholapur; and in Muddebihal the disease is said to have been brought from the village of Chandkawate in the Sindgi taluka, where cholera was then prevalent. In November it was in one village only in the Muddebihal taluka, and in December it invaded a village in the Bijapur taluka. It continued in the localities previously affected."

\* \* \* "From this date it disappeared till the 14th June, when it re-appeared in a village of the Dapoli taluka. In July the first case occurred on the night of the 12th, and it seems to have been mistaken for one of ordinary diarrhœa. From the 18th it spread to 11 villages in the Ratnagiri taluka, 6 villages of the Dapoli taluka, 1 in the Sangameshvar taluka, and in the town of Ratnagiri. The Collector stated that he could not satisfactorily ascertain the cause of this outbreak, but it appeared to him to have been imported from Bombay, and in a further letter he says, that the first case reported was that of a Kunbi, who was attacked by cholera at Bombay, and died in a village in the Dapoli taluka immediately on his return. The persons who burnt him subsequently suffered, and the epidemic gradually began to spread. In August it disappeared from Sangameshwar taluka, and appeared for the first time in the Chiplun taluka."

\* \* \* "The disease reached its maximum in August when 274 fresh cases and 155 deaths were reported from seven talukas and one town. Dr. Channer, the then Deputy Sanitary Commissioner, Konkan Division, inspected different affected localities and reported on them. In the Bhiwandi taluka, on the 25th, a cooly went from the village of Katordi to Pelard, an affected village in the Bassein taluka. He remained for the night and returned home next morning. Whilst at Pelard he visited a cholera stricken

patient, but by his own account did not eat, drink or sleep in his hut ; he slept in one about 150 yards off. He reached home at Katowli on the 26th, was attacked, and died on the 27th. On the 28th a case was reported from the village of Wetah about a mile distant. Here again the unfortunate man had come from Pelard to visit his father-in-law, he was taken ill and died the same day. The evidence in these cases points to contagion by human intercourse—contagion or propagation. On the 7th a case was reported from Kalyan—a Municipal town—here a cooly arrived on the 27th July from Purandhar—it is said that he was taken ill at Lanoli whilst in the train. On arrival at Kalyan station he was removed to the dispensary and died the same day. On the 7th a Hamal working at Kalyan station, was attacked and died.”

The report for 1882, the last issued, contains more allusions to the spread of cholera by pilgrims and others frequenting fairs than any previous report.

“ Cholera made its appearance in this district on the 15th January in Garkhindi, a small village of 363 inhabitants in the Parner taluka. This village is situated at a distance of about 15 miles to the north-west of Parner, and is not close to any of the main lines of roads in the district. The outbreak lasted for 13 days. From 28th January to 2nd June the entire district was exempt, but on that day it reappeared in the Parner taluka. And in June a few villages were attacked in the same taluka, which lies close to Sirur and is traversed by the Poona and Nagar high road. In July two other villages were attacked in the same taluka and 5 villages in the Shrigonda taluka, which lies to the south of the Parner taluka and within 4 miles of the station of Belwandi on the Dhond and Manmad Railway. Most of these cases were said to be principally due to the large number of pilgrims from Pandharpur residing there. On the 13th July it reached the cantonment of Ahmednagar. In August it proceeded across the collectorate eastwards, taking all the talukas en route, *viz.*, Nagar, Sheogaon,

Karjat and Jamkhed. In September it passed northwards to the talukas of Rahuri and Kopergaon, the route by rail and road from Nagar town to Mannad."

\* \* \* "In November it was only in one village of the Khed taluka, and in December in Baramati, a large village in the Baramati taluka, where the last case occurred on the last day of the year. Here the disease was ascribed to the great annual Jatra held at Phaltan (a town about 12 miles distant from Baramati) in honor of the god Rama on the 11th December. During this year the pilgrims attending the Alandi Fair were not attacked, but those who attended the Phaltan Jatra suffered."

\* \* \* "In the town of Kapadvanj itself there were 188 attacks and 82 deaths, and the Collector and the Deputy Sanitary Commissioner at once proceeded to it and other affected localities. The report regarding this outbreak by Dr. Colah, the Deputy Sanitary Commissioner, Gujarat Registration district, is given below"—

1. 'The first case of cholera occurred on the 12th July. An old *patidar* woman, aged about 60, went to see a relative at Gogavada, a village of Nadiad taluka distant 12 miles. This relative was taken ill with cholera and died. The *patidar* woman returned to her house in Kapadvanj, took ill immediately after, and died of cholera. Though the Hospital Assistant reported through the police patel that this woman died of cholera, yet the death was returned under fever. Through whose fault this false registration occurred, is under investigation. From information received it appears that about this time cholera existed in Gogavada of Nadiad taluka and in Kathlal of Kapadvanj taluka, villages situated on the opposite banks of the river Wurasī. In these villages the disease is said to have been imported by travellers from Ahmedabad, but it was not reported officially.'

"The Ahmedabad Collectorate was free for the first four months of the year, but on the 4th May a sudden outbreak was reported from two villages in the Viramgam taluka,

and during the month it spread rapidly to 12 villages in the same taluka. In the middle of the month it reached the town of Viramgam, and in the latter end of it was present in the Dhulia, Sanand, Parantij and Dholka talukas. At Sanand the disease is said to have been brought by a traveller from Viramgam. In Viramgam taluka there were 288 attacks and 147 deaths, and the remaining (38 attacks, and 15 deaths) took place in the other localities. According to the report of the Mamlatdar of Viramgam the origin of the disease is thus accounted for: 'A marriage party left a village in the Viramgam taluka and went to Vanod, a village under Rajkot in Kathiawar; but owing to an outbreak of cholera there the party (some of them seized with cholera) dispersed, and left for their respective villages. Some of them died after arrival in their villages.' In June the disease invaded the whole collectorate, except the Gogha taluka. It broke out in 41 fresh villages during the month."

The evidence contained in the above reports are not only accessible to Surgeon-General Cunningham but are actually furnished to him "by order" and yet in face of all this it is written:—"The experience of fairs and other gatherings in this country has, again and again, testified to the truth of the conclusion, that cholera is not carried by persons from one locality to another so as to cause persons not themselves exposed 'to the necessary local influences' to become affected by the disease. Coincidences certainly can be cited, in which the arrival of persons from a cholera affected district has been closely followed by an outbreak of the disease; but even these coincidences are far fewer than is generally supposed."

It seems to the writer that experience would point entirely the other way that cholera is carried by persons from one locality to another. An unprejudiced public will, however, be able to judge.

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